

MINNESOTA AVENUE METRORAIL STATION ACCESS IMPROVEMENT STUDY



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MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

Contents

Introduction 1

 Background..... 1

 Study Purpose 1

 Planning Context..... 1

 Relationship to Other Transportation Studies 2

Existing Conditions..... 3

 Transit Ridership..... 3

 Transportation Facilities..... 3

Pedestrian and Bicycle Access 5

Transit Access..... 7

Kiss & Ride Access 7

Park & Ride Access 8

Growth Forecasts and Future Projects 8

 Ridership Projections 8

 Station Area Development 8

Minnesota Avenue – Benning Road Government Center 9

Parkside 9

Alternatives..... 10

 Design Principles 10

Pedestrian and Bicycle Facilities..... 10

Transit Facilities 10

Kiss & Ride and Park & Ride Facilities..... 10

Other Design Precepts..... 10

 Improvement Alternatives 11

Pedestrian Bridge Options 11

Bus Facility..... 12

Kiss & Ride Options 12

Recommended Station Amenities 12

 Alternatives Analysis 21

 Station Capacity and Enhancements..... 22

Next Steps..... 23

Tables

Table 1: Existing Modes of Access at Minnesota Avenue Station..... 3

Table 2: Bus Lines and Routes with Stops at the Station..... 7

Table 3: 2030 Forecast Modes of Access at Minnesota Avenue Station..... 8

Table 4: Parkside Pedestrian Bridge – Pros and Cons 21

Table 5: Curved Bridge Option – Pros and Cons 21

Table 6: Bus Facility Alternative 1 – Pros and Cons 21

Table 7: Bus Facility Alternative 2 – Pros and Cons 22

Table 8: Curbside Transit – Pros and Cons 22

Table 9: Center Lane Transit – Pros and Cons 22

Table 10: Order of Magnitude Cost Estimates..... 24

Figures

Figure 1: Aerial View of Minnesota Avenue Station and Anacostia River 1

Figure 2: Other Transportation Studies 2

Figure 3: Pedestrians Crossing Minnesota Avenue 3

Figure 4: Minnesota Avenue Station Area and Facilities 4

Figure 5: Bus and Pedestrian Routes 5

Figure 6: Aerial View of Pedestrian Bridge..... 5

Figure 7: Ramps from Pedestrian Bridge to Tunnel 6

Figure 8: Pedestrian Access from Minnesota Avenue..... 6

Figure 9: View of Bus Facility 7

Figure 10: Kiss & Ride Area 7

Figure 11: Passenger Pick-up/Drop-offs on Minnesota Avenue 8

Figure 12: Station Area Development Locations 8

Figure 13: Government Center Buildings 9

Figure 14: Parkside Pedestrian Bridge Concept 9

Figure 15: Pedestrian Bridge Options 11

Figure 16: Curved Pedestrian Bridge Design at New Carrollton Station 11

Figure 17: Bus Transfer Facility Alternative 1..... 13

Figure 18: Bus Transfer Facility Alternative 1(with Transit Vehicles in Curbside Lanes on Minnesota Avenue..... 14

Figure 19: Bus Transfer Facility Alternative 1(with Transit Vehicles in Center Lanes on Minnesota Avenue..... 15

Figure 20: Bus Transfer Facility Alternative 2..... 16

Figure 21: Bus Transfer Facility Alternative 2(with Transit Vehicles in Curbside Lanes on Minnesota Avenue..... 17

Figure 22: Bus Transfer Facility Alternative 2(with Transit Vehicles in Center Lanes on Minnesota Avenue..... 18

Figure 23: Kiss and Ride with Vehicle Storage (with Transit Vehicles in Curbside Lanes on Minnesota Avenue) 19

Figure 24: Kiss and Ride with Vehicle Storage (with Transit Vehicles in Center Lanes on Minnesota Avenue..... 20

Figure 25: Diagram of Mezzanine (with Additional Elevators)..... 23

INTRODUCTION

Background

The Minnesota Avenue Metrorail station is located just east of the Anacostia River in Ward 7. The station was one of five stations that opened on November 20, 1978 when the Metrorail Orange Line was extended to New Carrollton. These included two stations in the District of Columbia, Minnesota Avenue, and Deanwood, and three stations in Prince George’s County, Cheverly, Landover, and New Carrollton. The Minnesota Avenue station serves Orange Line trains on the Metrorail system operated by the Washington Metropolitan Area Transit Authority (WMATA). The station provides a vital link to local and regional destinations for residents in the station area. Figure 1 is an aerial photograph of the station area.

Figure 1: Aerial View of Minnesota Avenue Station and Anacostia River



Source: Google Earth

Steady growth in the region, particularly around Metrorail stations, has generated increased transit ridership, but has also led to more vehicle traffic in station areas. As a result, the different modes of access often come into conflict in station areas. WMATA and local jurisdictional planners have recognized that

many existing Metrorail stations designed thirty years ago, such as the Minnesota Avenue station, need a new assessment to determine if existing site conditions for pedestrian access, bus operations, and vehicular traffic are adequate to meet existing capacity and future demand.

Study Purpose

Improving access to and from Metro is critical to meeting ridership goals and serving customer needs. Potential riders may also be lost if access constraints mean that the door-to-door journey involving Metro becomes more time consuming, unreliable or frustrating than an alternative means of travel, such as driving. Ultimately, the goal of improving station access is to attract additional customers by: enhancing the pedestrian experience with a safer and more attractive walking environment; maintaining a good level of service for transit access to the site, which includes buses and other transit vehicles; accommodating future access needs, which include vehicular traffic growth; and making transit use more convenient and attractive as a travel mode.

This study will provide the District Department of Transportation (DDOT) and the District Office of Planning (DCOP) with a baseline for their transportation and development projects in the Minnesota Avenue station area and identify WMATA operational needs before any District project goes forward. The purpose of the study is to provide conceptual planning and engineering solutions for multi-modal site access improvements at the Minnesota Avenue Metrorail Station. More specifically, this study will:

- Identify access deficiencies and conflicts between modes of arrival at the station.
- Analyze traffic studies in the station area.
- Develop design alternatives demonstrating improvements for pedestrians, bicycles, and vehicular traffic accessing the station.
- Develop inter-modal traffic improvements and recommend improvements for traffic operational problems on adjacent streets and intersections.
- Accommodate future growth and maximize the convenience and level of service at the Metrorail station.

Planning Context

The study is being coordinated with other District transportation projects, plans, and developments in the station vicinity. Improving access to the Minnesota Avenue Metrorail Station is consistent with other District planning efforts and initiatives. The station is located within the Anacostia Waterfront Initiative (AWI) region. The Anacostia Waterfront Initiative envisions an energized waterfront that will unify diverse

MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

areas with one of the city's greatest natural assets, the Anacostia River. The Initiative seeks to revitalize neighborhoods, enhance and protect parks, improve water quality and increase access to waterfront destinations. Minnesota Avenue is also one of the streets designated for improvements in the first round of the District's *Great Streets* program.

Improving access to the Minnesota Avenue station's Metrorail and Metrobus services will also support the creation of a more inclusive city by helping individuals and families in the station area have better access to jobs, schools, or other destinations, and build better ties to the region. Improvements at the Minnesota Avenue Metrorail station can also:

- Target investment in the local community.
- Strengthen neighborhood identity by improving a vital transportation link and public space.
- Help transform the Minnesota Avenue and Kenilworth Avenue corridors by improving the streetscape and pedestrian environment in the station area.
- Guide growth by enhancing transit access to nearby planned developments.

Relationship to Other Transportation Studies

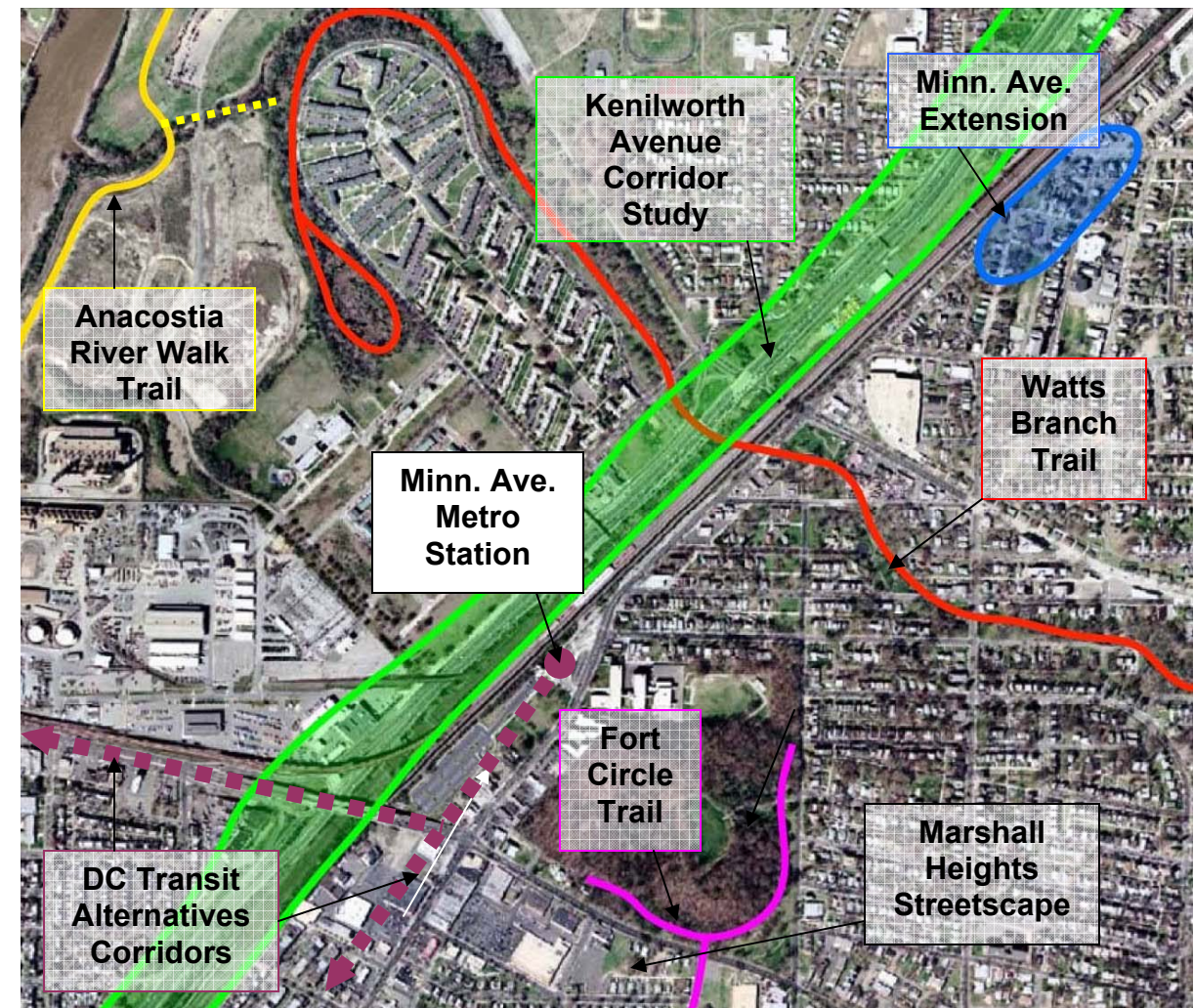
Several other transportation projects and master plans near the Minnesota Avenue Metrorail Station could affect station access. These other studies or projects include the DC Transit Alternatives Analysis (DCAA), Kenilworth Avenue Corridor Study (KACS), the Minnesota Avenue Extension, the Anacostia Riverwalk, the Marshall Heights Streetscape Project, and the Watts Branch Trail Rehabilitation. Figure 2 identifies the location of these other studies. Land use development projects in the station area, such as the Government Center project, are discussed later.

The DC Transit Alternatives Analysis identified three potential transit corridors with connections to the Minnesota Avenue Metrorail station. One of the corridors would create a new streetcar line on Minnesota Avenue from the Anacostia Metrorail station to the Minnesota Avenue Metrorail station. The introduction of new transit lines or modes, such as streetcars, will affect access to the station

The KACS is a major component of the Anacostia Waterfront Initiative (AWI). Design features of the existing roadway need to be improved, repaired, or redesigned to support the current and future needs of the area. Kenilworth Avenue is located adjacent to the Metrorail Orange line in the station vicinity. The study is proposing to rehabilitate the current pedestrian bridge over Kenilworth Avenue that connects to the station. The rehabilitation would improve the visibility and environment of the bridge by relocating the large sign on the side of the bridge, provide additional lighting, and cover the walkway with a canopy, among other things.

The Minnesota Avenue Extension would extend Minnesota Avenue to provide a connection of Minnesota Avenue between Sheriff Road and Meade Street. The proposed extension is located northeast of the Minnesota Avenue Metrorail station and would consist of the construction of a new four-lane roadway and associated intersection improvements, upgrading and installing traffic control measures, modifying or constructing drainage facilities, and adding pedestrian facilities. Providing the connection could improve bus, pedestrian, and vehicular access to the station.

FIGURE 2: OTHER TRANSPORTATION STUDIES



The Anacostia Riverwalk project consists of the creation of a multiuse trail and connecting points that travel along the east side of the Anacostia River from the Washington Navy Yard to Benning Road, and on the west side of the Anacostia River from the Anacostia Naval Station to the Bladensburg trail in Prince George's County, Maryland. A portion of the proposed trail would be located approximately one half mile northwest of the station near the Anacostia River.

MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

The Marshall Heights Streetscape Project includes the improvement of commercial façades along Minnesota Avenue and Benning Road. Activities included repair and replacement of storefront windows and doors, installation of uniform signage, lighting, painting, and creation of a cohesive appearance.

The Watts Branch Trail was constructed in 1978 by the DC Department of Parks and Recreation (DPR). The Trail is 1.9 miles long and functions as a neighborhood circulation path. The Trail has suffered from illegal dumping and has gaps that require bicyclists to transition to the street traffic and/or sidewalk with no signage or pavement markings to indicate the continuation of the trail corridor. The rehabilitation effort will improve trail conditions and connectivity to the neighborhood and station.

EXISTING CONDITIONS

The study team conducted site assessments, analyzed traffic and collision data provided by DDOT, identified bus routes and pedestrian flows, reviewed ridership data for both Metrorail and Metrobus, and counted pedestrian traffic to help identify existing deficiencies and conflicts between modes of access at the station. The Washington Regional Network for Livable Communities (WRN) also provided information on existing access problems, including a pedestrian survey of local residents.

FIGURE 3: PEDESTRIANS CROSSING MINNESOTA AVENUE (LACK OF CROSSWALKS CREATES UNSAFE PEDESTRIAN AND TRAFFIC CONDITIONS)



Transit Ridership

Table 1 lists the existing modes of access for Metrorail boardings at the Minnesota Avenue Station for the AM peak, AM off peak, PM peak, PM off peak, and daily total. The most common mode of access to Metrorail is walking. Metrobus provides the second most boardings to Metrorail. The volume of bus boardings at the station is more than twice that of rail boardings and actually exceeds the number of rail boardings at Deanwood, Eisenhower Avenue, Cheverly, and Morgan Boulevard stations combined. The station has approximately 6,400 weekday bus boardings, the fourth largest volume of bus boardings in the Metro system behind 1) Silver Spring, 2) Pentagon, and 3) Anacostia. The X2 route has approximately 1,900 daily boardings at the station. The X2 has three of the top 20 highest transfer volume pairs with other routes at this station. There are also 3,088 bus boardings at the nearby Minn. Ave./Benning Rd. Intersection. The high volume of bus service and bus-to-bus transfers creates more potential pedestrian/vehicle conflicts.

TABLE 1: EXISTING MODES OF ACCESS TO METRORAIL

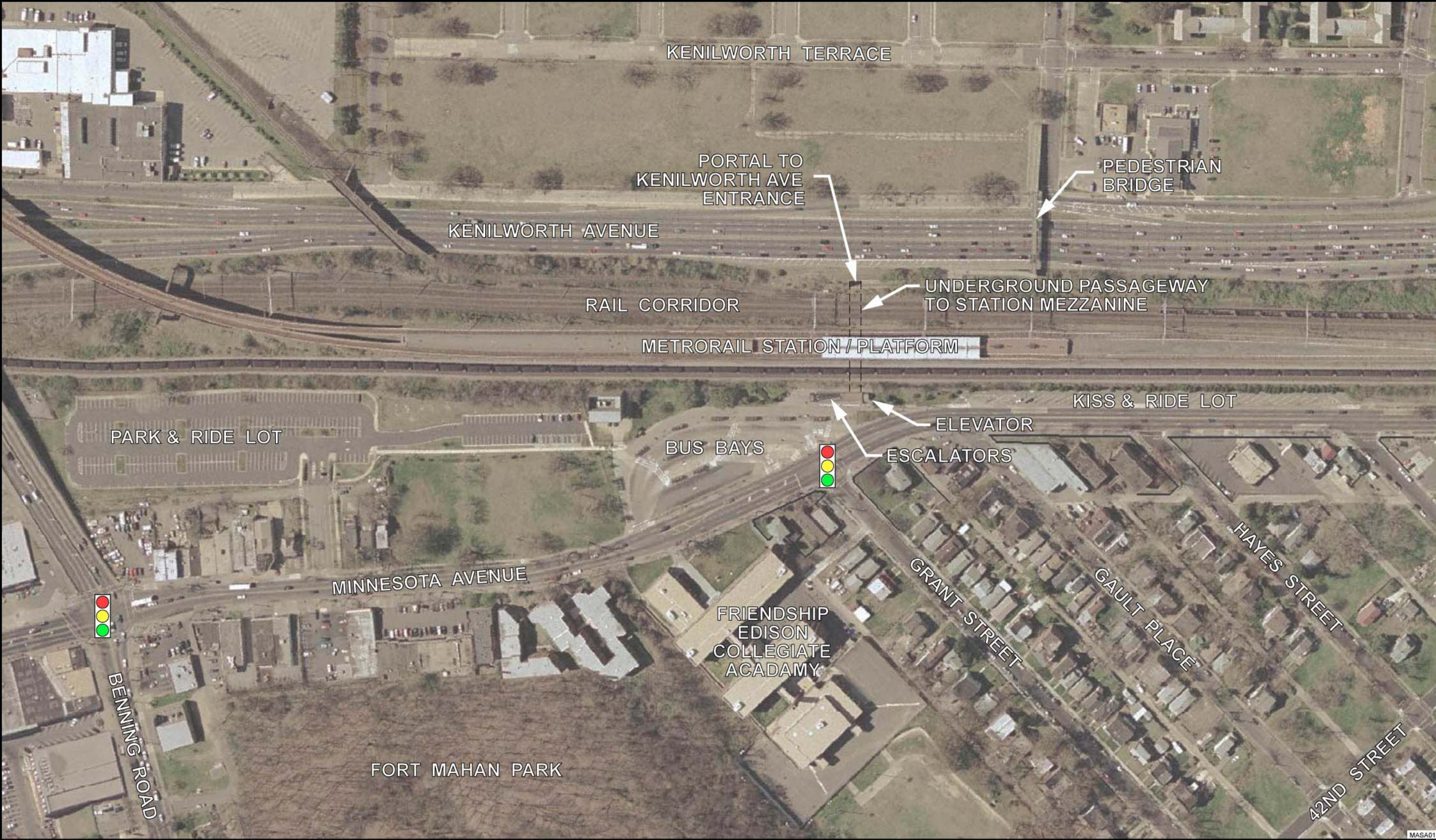
| Mode of Access | AM Peak | | AM Off Peak | | PM Peak | | PM Off Peak | | Daily | |
|------------------|---------|------|-------------|------|---------|------|-------------|-------|-------|------|
| | No. | Pct. | No. | Pct. | No. | Pct. | No. | Pct. | No. | Pct. |
| Walk or bicycle | 378 | 25% | 205 | 34% | 321 | 50% | 138 | 63% | 1,042 | 35% |
| Bus | 501 | 33% | 217 | 36% | 161 | 25% | 55 | 25% | 934 | 31% |
| Dropped off | 88 | 6% | 60 | 10% | 96 | 15% | 28 | 12.5% | 272 | 9% |
| Drove and parked | 527 | 35% | 121 | 20% | 64 | 10% | 0 | 0% | 712 | 24% |
| Total | 1,511 | 100% | 604 | 100% | 642 | 100% | 220 | 100% | 2,977 | 100% |

Source: 2002 Metrorail Passenger Survey, WMATA. Note: Percentages may not add up to 100% due to rounding.

Transportation Facilities

The Metrorail Orange Line runs between Kenilworth Avenue, a CSX rail corridor, and Minnesota Avenue in the station vicinity. Kenilworth Avenue is a six-lane major arterial providing a link between Interstate 395 (I-395), Interstate 295 (I-295), and the Baltimore-Washington Parkway. Access from Kenilworth Avenue is an indirect route via Nannie Helen-Burroughs Avenue and Minnesota Avenue. Minnesota Avenue is a four-lane arterial roadway, which provides bus and vehicle access to the station’s site facilities. A pedestrian bridge across Kenilworth Avenue that connects to a tunnel below the CSX rail corridor is the only means of pedestrian access from the northwest side of station. The existing pedestrian bridge and tunnel open 24 hours a day. Figure 4 is a map of the station area and WMATA facilities. Existing bus and pedestrian routes, which includes sidewalks and marked crosswalks, to the station are illustrated in Figure 5.

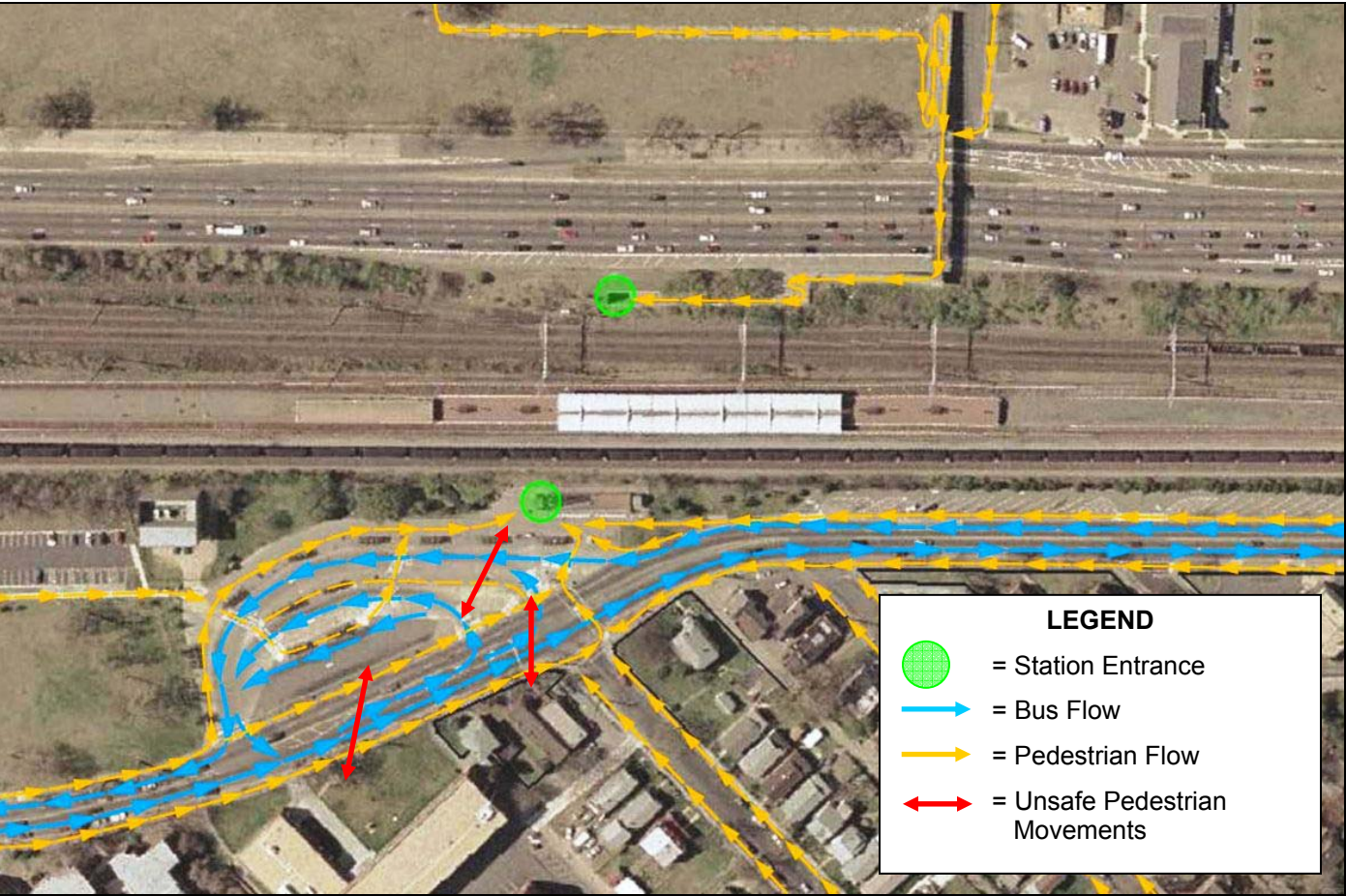
FIGURE 4: MINNESOTA AVENUE STATION AREA AND FACILITIES



MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

The Minnesota Avenue Station originally opened with six bus bays and eighteen Kiss & Ride stalls. The Kiss & Ride stalls were later converted to bus facilities to accommodate additional bus service. Kiss & Ride spaces are now located along a narrow strip of land northeast of the station entrance.

FIGURE 5: BUS AND PEDESTRIAN ROUTES



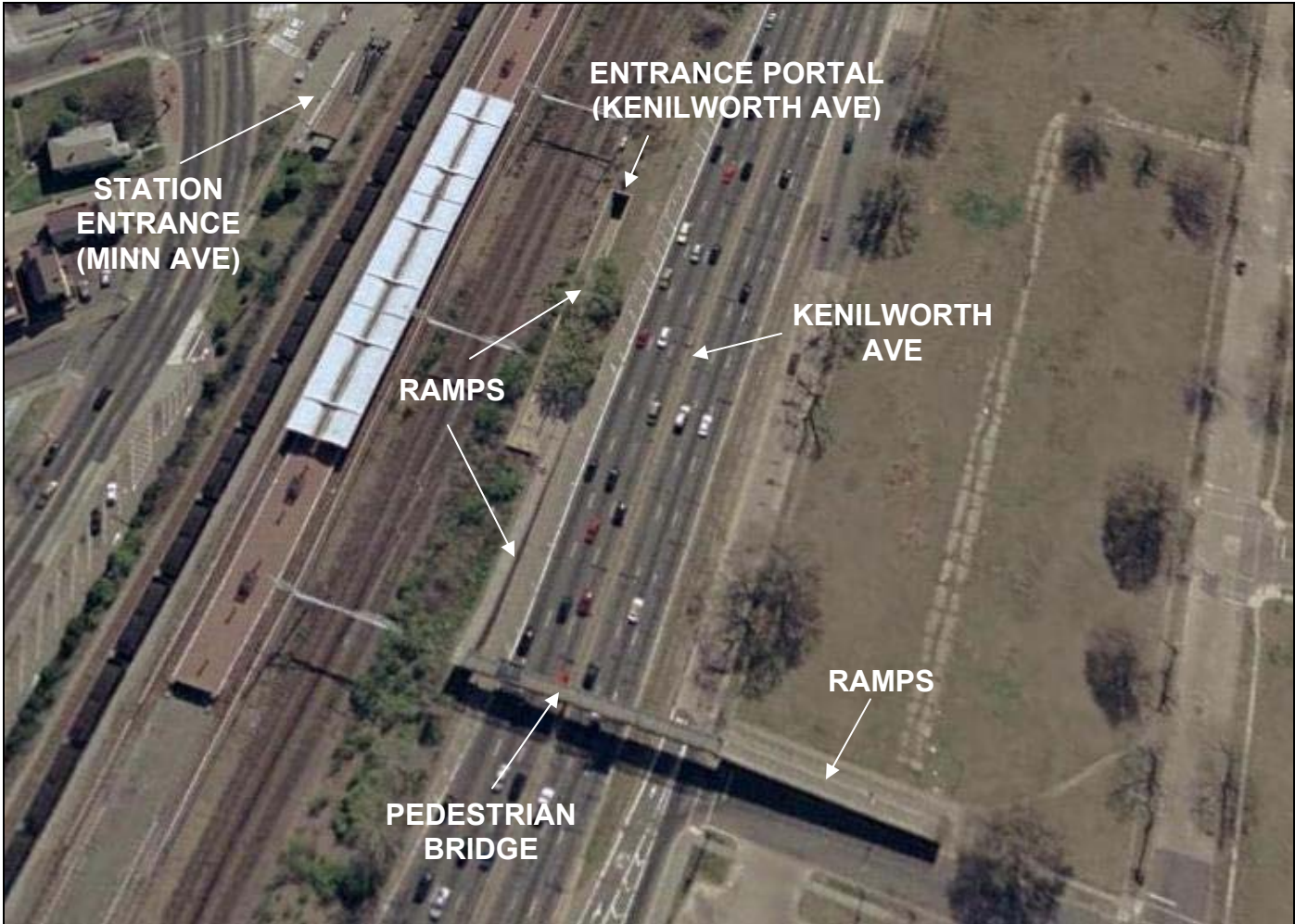
Pedestrian and Bicycle Access

Pedestrian and bicycle access is the largest source of Metrorail ridership at the Minnesota Avenue station. Current WMATA guidelines and standards for station facilities require priority access to all pedestrians in station site planning. Previous station planning efforts did not always provide priority access for pedestrians. At many existing stations, similar to the Minnesota Avenue station, pedestrians traveling on the station site must cross bus bays, parking lots, and vehicular lanes, to reach the station entrance.

Pedestrians can access the station from either direction along Minnesota Avenue or by using the pedestrian bridge over Kenilworth Avenue. The pedestrian bridge crosses over Kenilworth Avenue and ramps down to a passageway tunnel underneath the Metro and CSX rail corridor to the station mezzanine

and to the bus facility located on Minnesota Avenue. Pedestrian counts taken within the station indicated that approximately half of the pedestrians used the tunnel to access Metrorail, with the other half continuing through to the bus facility or neighborhood.

FIGURE 6: AERIAL VIEW OF PEDESTRIAN BRIDGE



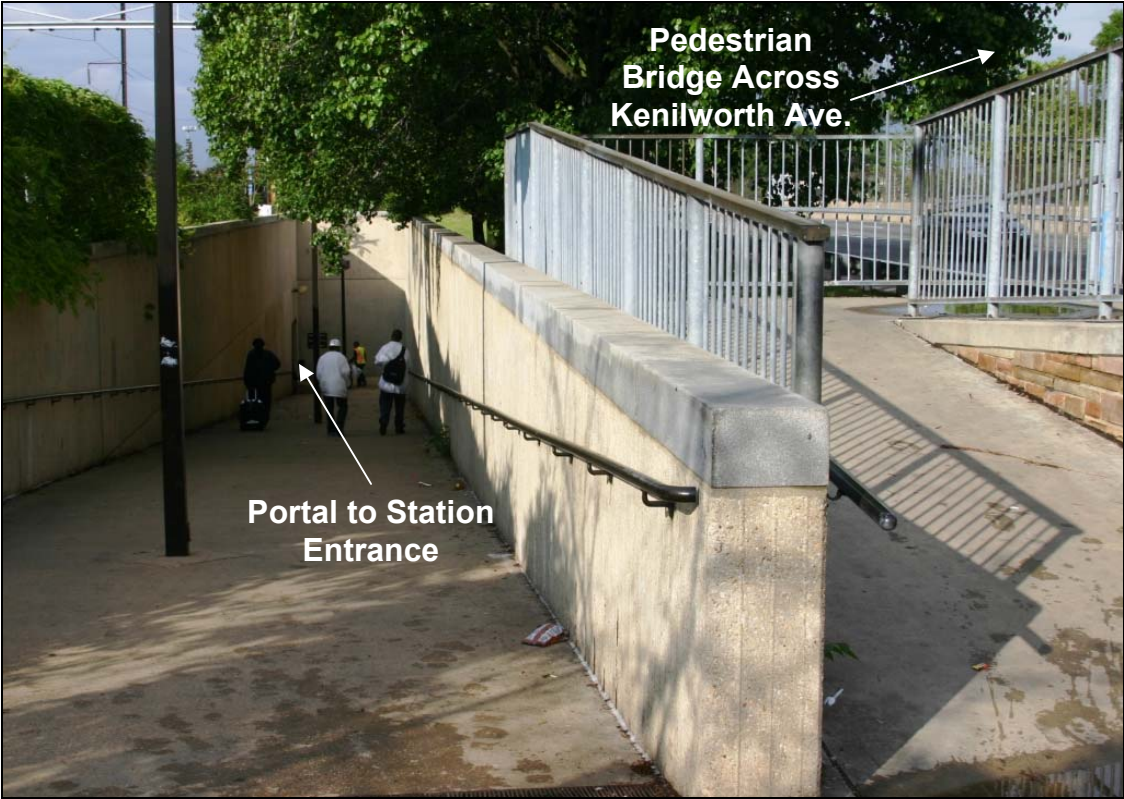
Source: Google Earth

The layout of the pedestrian bridge and ramps is indirect and extends the actual walking distance by approximately 250 feet, measured along the actual travel path. The indirect path and long ramps are especially problematic for persons with disabilities or mobility impairments. The layout of the ramps also creates several “blind corners” for potential hiding places. In the WRN pedestrian survey, many people indicated that they avoid using the bridge due to security concerns, particularly at night. The ramp leading down to the tunnel creates a “canyon” effect (Figures 6 and 7) and is not easily visible from other areas of the site. The existing bridge and ramps also have recurring maintenance problems including vandalism, snow removal, and standing water.

MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

The Minnesota Avenue entrance consists of two escalators and one street elevator. The escalator way does not currently have a canopy to provide weather protection. The street elevator is located away from major pedestrian activity and existing evergreen vegetation surrounding the elevator impedes visibility, which may make the area feel less safe and secure for patrons.

FIGURE 7: RAMPS FROM PEDESTRIAN BRIDGE TO TUNNEL



Pedestrian deficiencies on the Minnesota Avenue side of the station include a lack of crosswalks across Minnesota Avenue in the station area. The Minnesota Avenue/Grant Street intersection has crosswalks on each leg, except the south leg. Students from the Friendship-Edison Collegiate Academy, which is located on Minnesota Avenue across from the station, often cross bus lanes and Minnesota Avenue at unmarked locations because the existing crosswalks and pathways to the station are indirect.

The sidewalk on the station side along Minnesota Avenue is narrow with no landscaped buffer between pedestrians and the street. There are also four curb cuts along the sidewalk in front of the bus facility, however one curb cut is closed to vehicles. Exclusive bicycle lanes are not marked on any streets in the study area. Bicyclists can ride in the curb lane on these streets; however, bicycling on Minnesota Avenue or Benning Road is hazardous because of the high speed and volume of traffic. Bicycle racks and lockers at the station are not typically used. Only one of the four lockers is currently rented and no bicycles were parked in the bicycle rack during the site visits. This may be due to poor bicycle access to the site or

concerns about vandalism and theft. Grant Street does provide access to the Watts Branch Trail, although not marked.

FIGURE 8: PEDESTRIAN ACCESS FROM MINNESOTA AVENUE



Source: Google Earth

In general, the station area lacks pedestrian amenities and landscaping, which creates a utilitarian and unwelcoming environment. There is no sense of arrival for station customers and the existing site layout does not provide a logical direction of pedestrian flow. The area lacks signage for pedestrians directing them from the station to the Kiss & Ride, bus bays, or to local points of interest. As illustrated in Figure 9, light fixtures in the bus facility vary in style and height, with many designed for larger parking areas rather than for pedestrian waiting areas. The bus facility also needs more seating both within bus shelters and near the station entrance. The sidewalk along the Kiss & Ride area is narrow with no buffer between the pedestrian pathway and Minnesota Avenue.

MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

FIGURE 9: VIEW OF BUS FACILITY



Transit Access

Metrobus services provide the only current means of connecting transit service to the Minnesota Avenue station. Seven bus lines, consisting of 11 routes, access the station. Bus lines and routes with stops at the Minnesota Avenue Station are listed in Table 2. Four of the bus lines (Sheriff Road-River Terrace Line, Mayfair-Marshall Heights Line, Capitol Heights-Benning Heights Line, and Minnesota Ave-M Street Line) have northbound and southbound stops at the station.

TABLE 2: BUS LINES AND ROUTES WITH STOPS AT THE STATION

| Bus Line and (Route) | Bus Stop Type (and Direction)at Minnesota Ave. |
|---------------------------------------|--|
| Minnesota Avenue-Anacostia Line (U2) | Start/Terminus(SB) |
| Sheriff Road-River Terrace Line (U4) | Start/Terminus (NB), Through (SB) |
| Mayfair-Marshall Heights Line (U5,6) | Start/Terminus (NB), Through (SB) |
| Capitol Hts-Benning Hts Line(U8) | Start//Terminus (NB), Through (SB) |
| Minnesota Ave-M Street Line (V7,8,9) | Through (NB), Through (SB) |
| Benning Road-Potomac Park Line (X1,3) | Start/Terminus (SB) |
| Benning Road-H Street Line (X2) | Start (SB) |

Note: Southbound includes westbound routes and northbound includes eastbound routes.

The bus facility off Minnesota Avenue has eleven bays with ten bays currently in use. There are no on-street bus stops. There are two entrances to the bus facility, all located near the Minnesota Ave./Grant Street intersection and only one exit. Buses travel through the facility on one of three bus lanes and exit to

Minnesota Avenue at one location at the southeast end of the site. Layover space is available for buses, but is not convenient, since they cannot re-circulate within the facility. The interior bus bay platforms are located on narrow islands in the center of the facility, which require pedestrians to cross bus lanes at several locations. The widths of these bus platforms do no meet current WMATA design guidelines.

Kiss- & Ride Access

The existing Kiss & Ride facility is located northeast of the station along a strip of land and provides 20 short-term parking spaces. The narrow site does not allow vehicles to re-circulate within the facility, nor does it provide good visibility to the station entrance from waiting vehicles. From site observations, passenger pick-up and drop-off activity was infrequent at the Kiss & Ride area, but was more common at other areas of the site. Cars often wait along Minnesota Avenue during the peak PM period, impeding traffic operations. Some vehicles entered the bus bay area to drop-off/ pick-up passengers, even though the area is designated as bus only. The existing Kiss & Ride parking spaces are predominately occupied by non-transit users with numerous expired meter violations noted.

FIGURE 10: KISS & RIDE FACILITY



Source: Google Earth

FIGURE 11: PASSENGER PICK-UP/DROP-OFFS ON MINNESOTA AVENUE



Park & Ride Access

The existing Park & Ride lot is located south of the station along the Minnesota Avenue corridor. The only access road to the Park & Ride lot is via an unsignalized intersection from Minnesota Avenue located between Benning Road and Grant Street. The lot contains 333 parking spaces. A new parking structure will be constructed in conjunction with the Government Centers development that will maintain approximately the same amount of parking for transit customers. The new parking structure will be constructed on the portion of the existing lot located closest to the station entrance, which will improve access for Metrorail passengers who drive and park at the station. The access road for the Government Center site will provide access to the structure in a configuration similar to the existing access.

GROWTH FORECASTS AND FUTURE PROJECTS

Ridership Projections

Future Metrorail trips for each mode of access were identified by applying the forecasted mode-by-mode growth rates from the Dulles Rapid Transit Project study to the mode share data in the 2002 WMATA Passenger Survey, as presented in Table 1. The results are shown in Table 3. Ridership and mode share forecast will likely be revised after WMATA completes the Station Inventory and Ridership Forecasts program later this fiscal year. According to the current forecast, walking trips and bus trips provide the largest sources of Metrorail ridership. Planned developments, such as the Government Center and Parkside could significantly increase the number of walking trips to and from the station. These developments are discussed in the next section.

TABLE 3: 2025 FORECAST MODES OF ACCESS AT MINNESOTA AVENUE STATION

| Mode of Access | AM Peak | | AM Off Peak | | PM Peak | | PM Off Peak | | Daily | |
|------------------|---------|------|-------------|------|---------|------|-------------|------|-------|------|
| | No. | Pct. | No. | Pct. | No. | Pct. | No. | Pct. | No. | Pct. |
| Walk or bicycle | 605 | 25% | 306 | 34% | 450 | 50% | 182 | 63% | 1,582 | 35% |
| Bus | 847 | 35% | 324 | 36% | 225 | 25% | 73 | 25% | 1,401 | 31% |
| Dropped off | 145 | 6% | 90 | 10% | 135 | 15% | 35 | 12% | 452 | 10% |
| Drove and parked | 822 | 34% | 180 | 20% | 90 | 10% | - | 0% | 1,085 | 24% |
| Total | 2,420 | 100% | 900 | 100% | 900 | 100% | 290 | 100% | 4,520 | 100% |

Source: 2002 Metrorail Passenger Survey, Dulles Study projections

Station Area Development

Two large development projects are located in the station area. The Minnesota Avenue–Benning Road Government Centers (Government Center) and Parkside are illustrated in Figure 7. The combined area of the two development sites constitutes a significant portion of the land within the immediate station area. These two developments will significantly increase the development intensity and add create more mixed land uses within the station area.

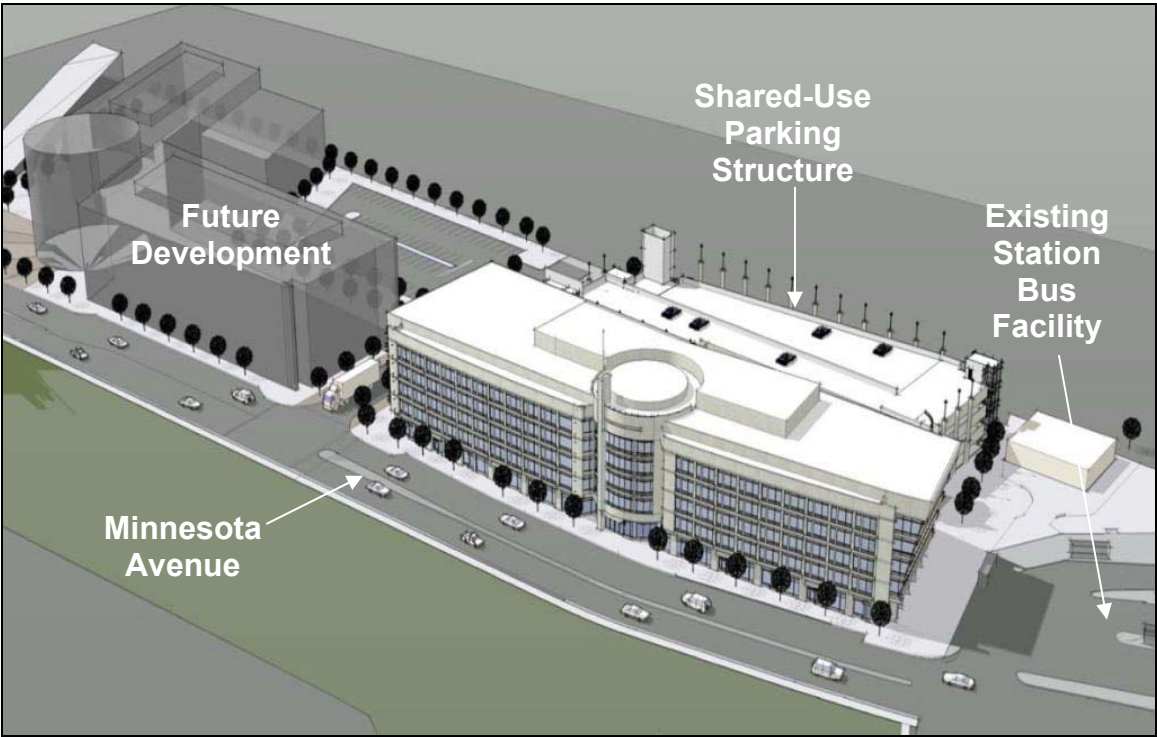
FIGURE 12: STATION AREA DEVELOPMENT LOCATIONS



MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

Minnesota Avenue - Benning Road Government Center. The Government Center buildings are being built to help revitalize downtown Ward 7 by relocating the District Department of Employment Services and the Department of Health Services to the area. The project site is located adjacent to the station on the northwest corner of Minnesota Avenue and Benning Road. The project will include office space, ground floor retail, and a four-story parking structure, which will include Metro parking. The existing Park & Ride lot is located on the development site. The first office building constructed will be a five-story facility with small retail establishments on the ground floor and meeting space available for community use. The other office building located closer to Benning Road will be four or five stories. The master plan also recommends adding a center turn lane on Minnesota Avenue for northbound vehicular traffic entering the site, a left-turn lane on Minnesota Avenue for southbound traffic turning east onto Benning Road, and a parking lane on the west side of the Minnesota Avenue. The new parking structure with shared office and transit use will replace the existing Park & Ride lot with construction scheduled to begin in October 2005. Both office buildings are scheduled for completion in late 2006 or early 2007.

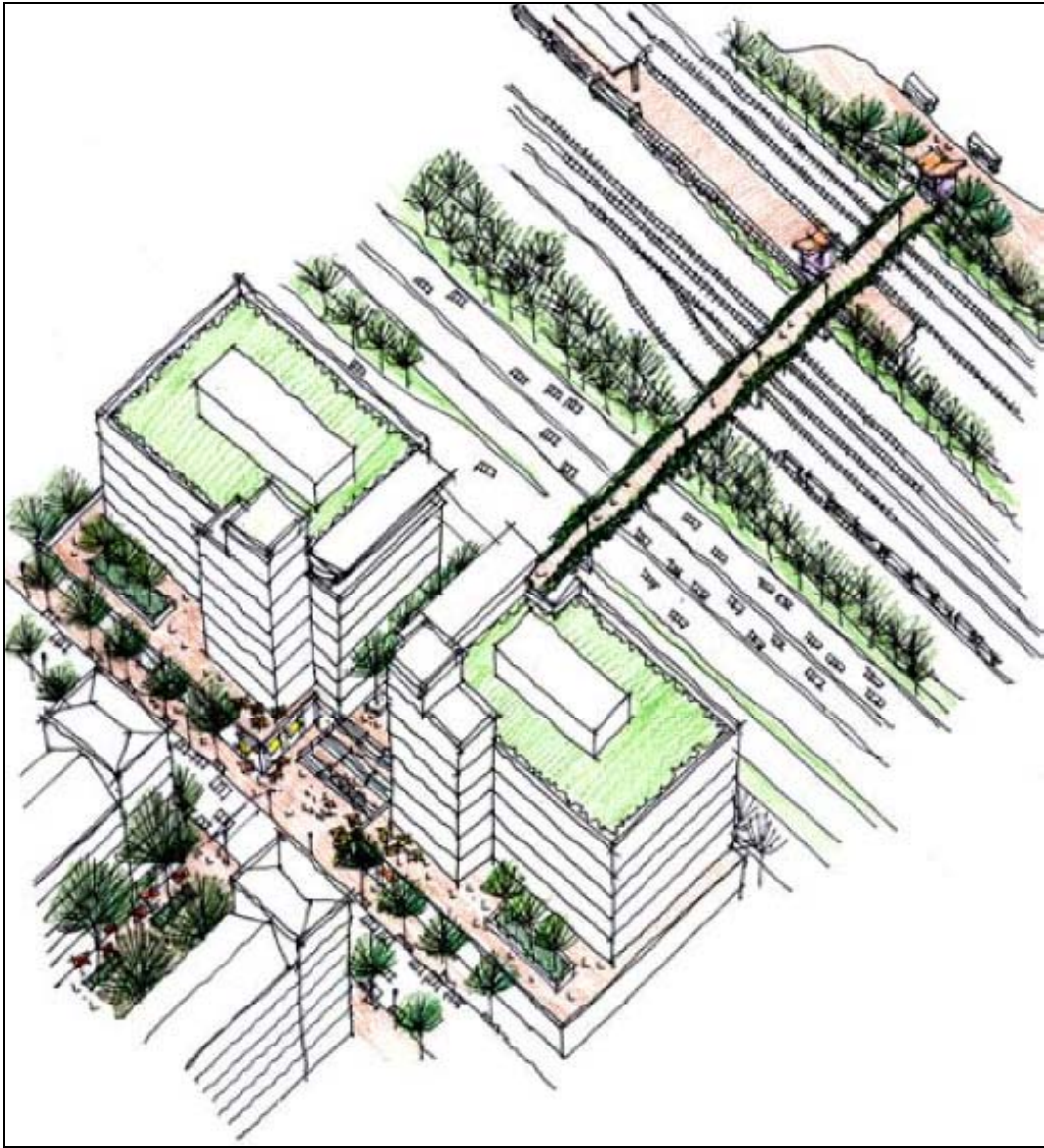
FIGURE 13: GOVERNMENT CENTER BUILDINGS



Parkside. The Parkside area is located northwest of Kenilworth Avenue and includes several developed and undeveloped parcels, which are part of the planned Parkside development. A draft master plan of the development was prepared for use in a recent public workshop, which was attended by the community, DDOT, WMATA, and other jurisdictional and federal agencies. The current draft master plan for the site proposes adding approximately 1,500 - 2,000 residential units, 250,000 SF of office and 30,000 SF of retail

uses. A key element of the development plan related to station access, involves replacing the existing pedestrian bridge across the Kenilworth Avenue with a new bridge that connects the development directly to the west station entrance, the bus facility, and the Central Northeast neighborhood along Minnesota Avenue, including the new Government Center development. The proposed bridge (see Figure 14) would be aligned with the central axis of the Parkside development. The new crossing would span the entire Kenilworth Avenue and rail corridors landing in the bus facility area and would need to be high enough to provide adequate clearance over the CSX tracks. The bridge would connect with Parkside in an area surrounded by active uses, such as retail shops, before stepping down to Kenilworth Terrace.

FIGURE 14: PARKSIDE PEDESTRIAN BRIDGE CONCEPT



Source: Draft Master Plan for Parkside (Prepared by Urban Design Associates)

ALTERNATIVES

Design Principles

Before design alternatives for station site improvements were developed, design principles or general design goals for pedestrian and bicycle facilities, transit facilities, and other passenger amenities were established in discussions with DDOT, DCOP, WRN, Parkside Developers, and WMATA. Design principles are discussed next.

Pedestrian and Bicycle Facilities

Good pedestrian access to the station entrance is essential in station site and access planning since all transit customers that are not walking to the station will ultimately become pedestrians when transferring between modes. For pedestrian pathways connecting to a station site, providing a safe and convenient walking environment with clear, un-fragmented, and integrated pedestrian paths to the station will encourage more customers to walk. The following design principles were recommended for pedestrian and bicycle facility improvements:

- Provide wide sidewalks, street trees, benches, wayfinding signage, and safe pedestrian crossings along Minnesota Avenue and across bus access points;
- Accommodate pedestrian desire-lines and provide the most direct path possible, while minimizing pedestrian crossings of bus lanes;
- Add pedestrian count-down signals and marked crosswalks to improve Minnesota Avenue crossings;
- Replace or renovate the existing pedestrian bridge across Kenilworth Avenue with a wider crossing, designed using passive and active security elements.;
- Provide wayfinding and signage to bicycle paths and trails (Anacostia Riverwalk and Watts Branch via Grant Street) and other points of interest in the station vicinity;
- Consider relocating bicycle parking within view of a station manager to provide better security, including locating bicycle racks inside the station passageway, but outside of the mezzanine.

Transit Facilities

Transit facilities should be designed to accommodate bus access and capacity demand during the PM peak hour period—the PM peak hour period is used for planning transit facilities when transit headways are more frequent and passenger boardings are greater than during non-peak times. Vehicle dwell times and passenger queuing lines are also longer during PM periods with the greatest number of passenger

boardings, when fare collection is required. The Minnesota Avenue station is a terminal station for a majority of the bus routes serving the station, thus longer dwell times are experienced when buses layover to wait for its scheduled time of boarding or departure. However, some of the through running southbound bus stops could be relocated to curbside on Minnesota Avenue. Providing on-street stops for any of the southbound through bus routes would improve bus service operations, while reducing off-street bus bay demand.

The following design principles were developed for the bus and streetcar facilities.

- Provide a more efficient layout of the off-street bus facility that has internal circulation potential, an adequate number of bus bays and layover space;
- Maintain the existing number of bus bays that are currently in use
- Provide curbside bus stops without pull-offs on Minnesota Ave.;
- Provide connections to platform for streetcar service along Minnesota Avenue and provide options for streetcar vehicle storage, since the planned routes would terminate at the station.
- Provide enhanced customer amenities at both bus and streetcar facilities including continuous platform shelters, adequate seating, windscreens, trash receptacles, and signage.

Kiss & Ride and Park & Ride Facilities

The narrow shape of the existing Kiss & Ride limits the available options for redesigning this facility. Improvement options for the Kiss & Ride facility should improve pedestrian access along Minnesota Avenue. Options for the Park & Ride facility were not considered, since a new parking structure has already been designed for Government Center development, which replaces the existing WMATA parking.

Other Design Principles

Other design principles included:

- Create a sense of arrival at the station.
- Reduce the amount of paved area and create more public space and opportunities for public art.
- Improve safety and security of transit patrons.
- Improve the appearance of the station site and generally maximize the convenience and level of service at the station.

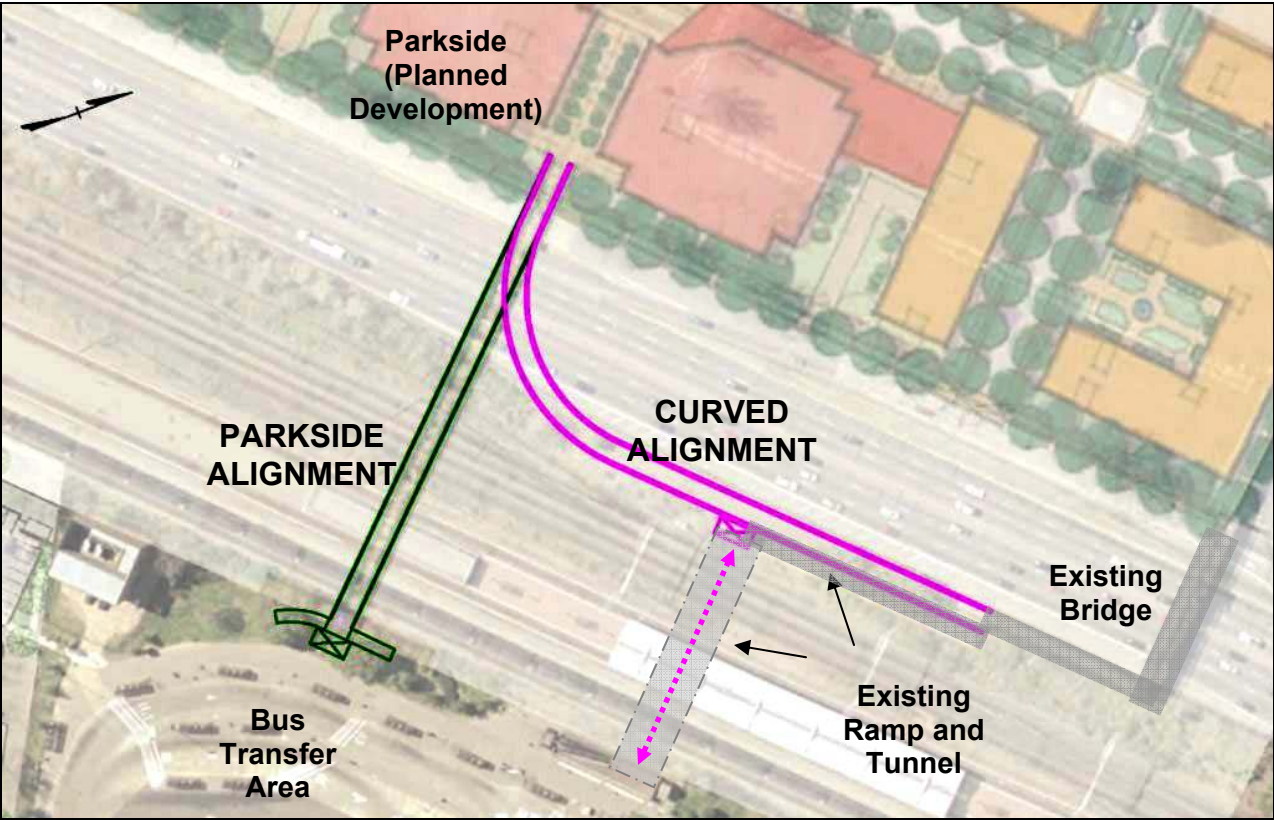
Improvement Alternatives

The improvement alternatives were developed as sketch/planning-level concepts with interchangeable elements. For instance, alternatives for the bus facility can be combined with any of the pedestrian crossing options. The improvement alternatives include two options for a new pedestrian bridge across Kenilworth Avenue, two options for the layout of the bus facility, two options for the Kiss & Ride facility, as well as recommendations for station amenities. Order of magnitude cost estimates for the alternatives are included in Table 10 at the end of the report.

Pedestrian Bridge Options

Two pedestrian bridge options were developed that would improve access from the Minnesota Avenue Station entrance to the north side of Kenilworth Avenue, the Parkside development, and the Anacostia Riverwalk Trail. The bridge alternatives are illustrated in Figure 15. Both alternatives connect to the same location between two office buildings into the commercial center of the Parkside development. According to the Parkside Developers, the viability of the development is contingent on a direct connection to the Metrorail station. Both bridge options should have a continuous walkway canopy due to the difficulty with snow removal operations above an operating railway and a major thoroughfare.

FIGURE 15: PEDESTRIAN BRIDGE OPTIONS



The first option, the Curved Pedestrian Bridge, would be a 15' wide covered bridge that would connect to the existing portal on the north side of the station. The structure would be curvilinear in plan, similar to the pedestrian bridge currently in use at the New Carrollton Metro station (Figure 16). This option would include two new elevators located near the passageway entrance and a ramp connecting to the existing ramp. The location of the bridge landing adjacent to and directly above the existing tunnel entrance would provide better visibility within the site than the existing bridge does.

The second option is based on the bridge design proposed in the Master Plan for the Parkside development that would consist of a 15' wide pedestrian bridge. It would be aligned with the central axis of the Parkside development for direct access to the east side of the station. The bridge would cross over Kenilworth Avenue and the rail corridors before terminating above the bus facility. Two elevators and stairways leading towards the station entrance and towards the Government Centers development would be provided. This option would improve the pedestrian connection between the Parkside development and the area along Minnesota Avenue, including the Government Center site and the bus facility. The crossing would be located entirely above grade, which would increase visibility and avoid some of the security issues associated with the use of the existing bridge, ramp, and passageway. In the long-term, this option could provide opportunities for a new station entrance connecting the bridge directly to the station platform.

FIGURE 16: CURVED PEDESTRIAN BRIDGE DESIGN AT NEW CARROLTON STATION



MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

Bus Facility

One of the primary issues in station site planning is the need to create improvements that are consistent with WMATA Standards and Guidelines, while fitting the layout of the facility into a relatively small and irregularly shaped site. Two alternatives were developed for the bus facility. A two-way bus loop design with a center island is used for both alternatives because it was the most efficient layout that will accommodate nine bays and layover spaces within the limited area. The center island layout is the preferred design to accommodate the high number of bus-to-bus transfers. However, in order to accommodate a two-way loop design on a small site, the bus lane widths provided are operable but narrower than WMATA guidelines suggest but would still be operable. The alternatives would maintain the existing number of bus stops, provide off-street circulation for buses, and improve the pedestrian environment. The creation of additional pedestrian space near the station entrance would provide opportunities for public use and the potential for relocating bicycle parking to a more visible area outside of the main pedestrian flows. In addition, both alternatives provide a connection for a streetcar platform on Minnesota Avenue.

Alternative 1 is the single-entrance alternative and is illustrated in Figures 17-19. This alternative would provide a full two-way loop for buses with 9 off-street bus bays for passenger boarding/alighting with storage for 2 buses. For all bus bays to be accessible from the layover spaces, buses would have to park in both directions, requiring a lane crossover for buses traveling in a clockwise direction. The single entrance alternative would reduce curb cuts along Minnesota Avenue, which creates conflict with pedestrian traffic, and provide a much larger pedestrian area in front of the station entrance. This alternative would also allow the existing bus turning lane to be converted into a full-length median and pedestrian refuge island. One on-street bus stop would be located on Minnesota Avenue for southbound through routes. Options for streetcar facilities on Minnesota Avenue are illustrated in Figures 18 and 19.

Alternative 2 is the two-entrance layout and is illustrated in Figures 20-22. This alternative would provide a full one-way loop with partial two-way circulation, allowing most buses the option to re-circulate within the facility. All buses could re-circulate on street if necessary. The plan has 9 bus bays for passenger boarding/alighting with storage for 2 buses and one on-street bus stop. This alternative would also provide a much larger pedestrian area in front of the station entrance than currently exists. Options for the streetcar facilities on Minnesota Avenue are illustrated in Figures 21 and 22.

A solid wall could be constructed under either alternative, located between the bus facility and the CSX tracks to provide a visual buffer that would replace the existing chain link fence and any landscaping displaced by the improvements. The wall should be high enough to dampen track noise, but should be not

be high enough to block visibility from the Metrorail platform. A wire mesh fence can be mounted to the top of the solid low wall for visibility.

Kiss & Ride Options

The narrow width of the existing Kiss & Ride area limits the available options for redesigning this facility. The first option for the Kiss & Ride facility would maintain the existing configuration with the addition of a pick-up/drop-off lane along Minnesota Ave. and improve the site lines between parked vehicles and the station entrance by altering existing landscaping. Figures 17-22 illustrate the added pick-up/drop-off lane near the station entrance for this option.

The second option could also add a pick-up/drop-off lane on Minnesota Avenue while maintaining a portion of the existing Kiss & Ride. This option would provide a convenient turnaround area for vehicles accessing the pick-up/drop-off lane, but would convert the northern section of the existing Kiss & Ride area from angled off-street parking to parallel parking along Minnesota Avenue with a wider sidewalk and improved streetscaping. This second alternative is illustrated with options for a streetcar service in Figures 23 and 24. The northern portion of the Kiss & Ride lot could be used for an off-street streetcar turnback track. The narrow shape of the Kiss & Ride facility limits its potential for other uses, but would be ideal for this use.

Recommended Station Amenities

All site amenities should be designed appropriately to match the context of the site. Improvements should include:

- Wayfinding signage should be located throughout the station and should direct customers to other places or routes near the station, such as the Government Center, local schools, Watts Branch Trail, Parkside Development, etc...;
- Create an informational and a wayfinding signage system that clearly directs and informs the pedestrians as to the Minnesota Station location, parking structure, and the different bus pick-up locations. Kiosks and real-time information on transit service and the availability of transfers should be provided;
- Relocate some bicycle parking inside the station to enhance security;
- Add an additional street elevator and platform elevator to maintain ADA accessibility when one of the elevator units is out-of-service for repairs or routine maintenance as shown on Figure 25;
- Provide canopies over the bus platform in the bus facility. Current WMATA guidelines and standards for bus facilities now require canopies over bus platforms to create parity with the amenities provided to Metrorail customers;
- Provide shelters with windscreen protection for bus customers at each stop;

(CONTINUED ON PAGE 12)

FIGURE 17: BUS FACILITY ALTERNATIVE 1

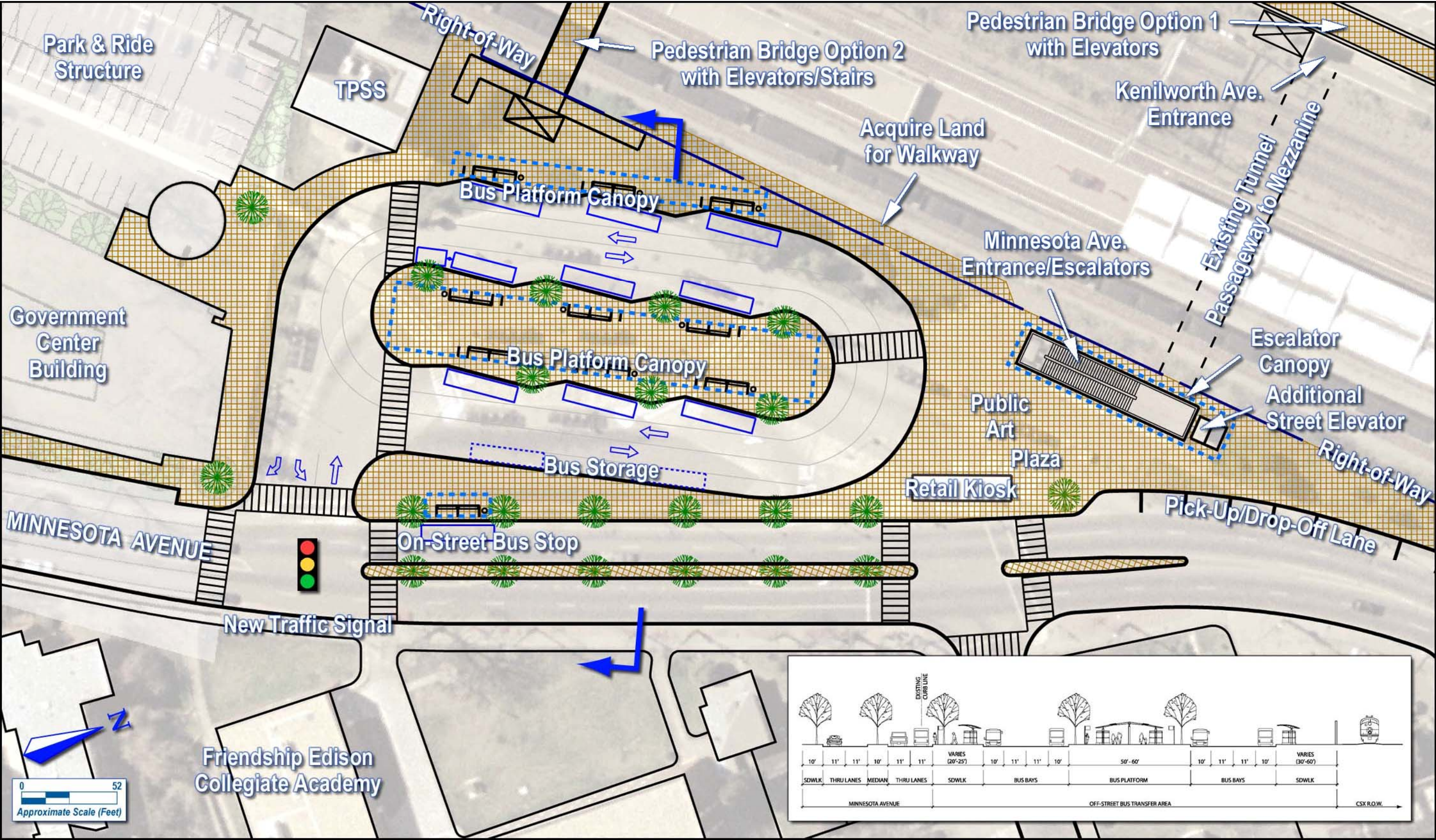


FIGURE 18: BUS TRANSFER FACILITY ALTERNATIVE 1 (WITH TRANSIT VEHICLES IN CURBSIDE LANES ON MINNESOTA AVENUE)

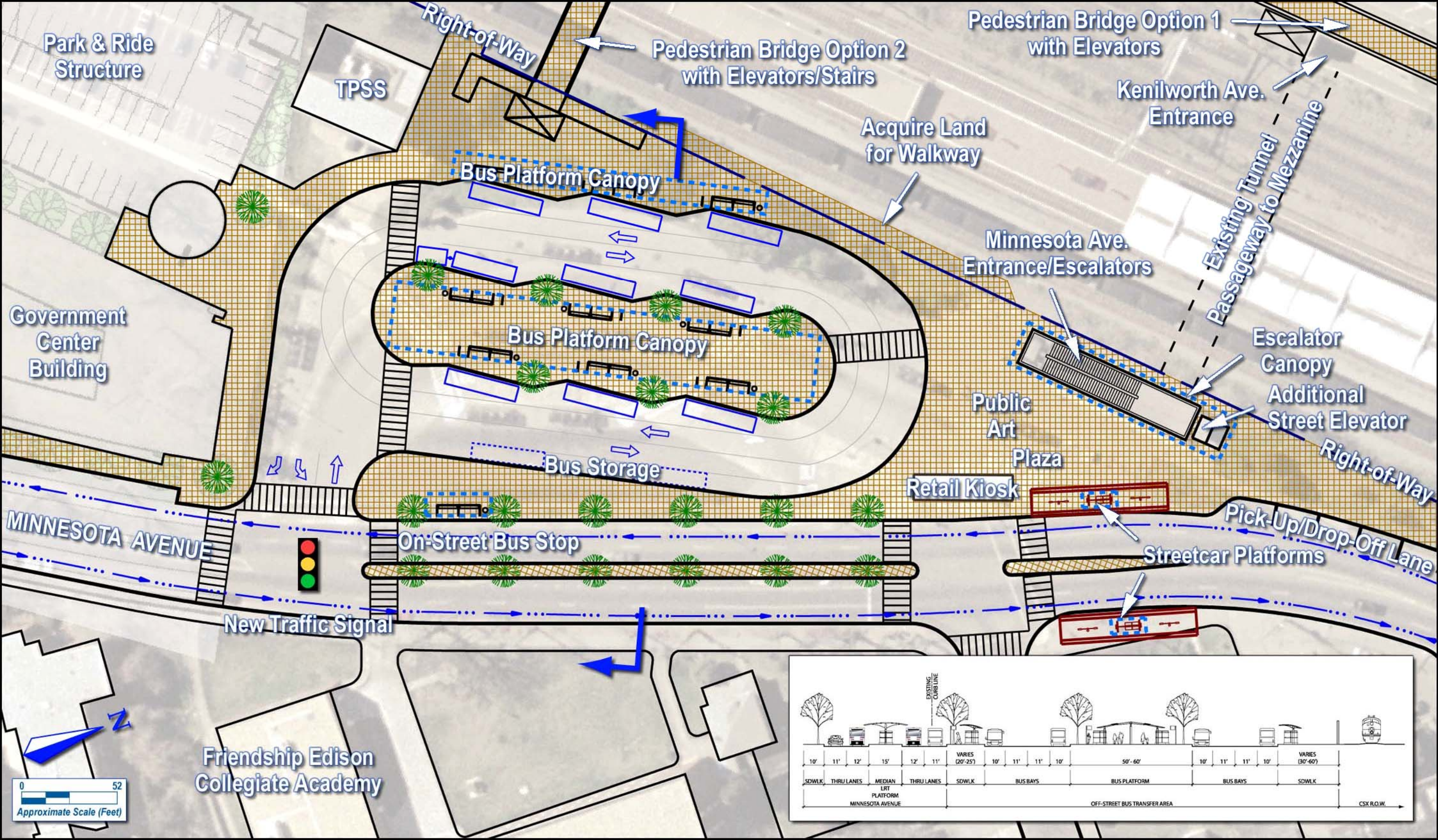


FIGURE 19: BUS TRANSFER FACILITY ALTERNATIVE 1 (WITH TRANSIT VEHICLES IN CENTER LANES ON MINNESOTA AVENUE)

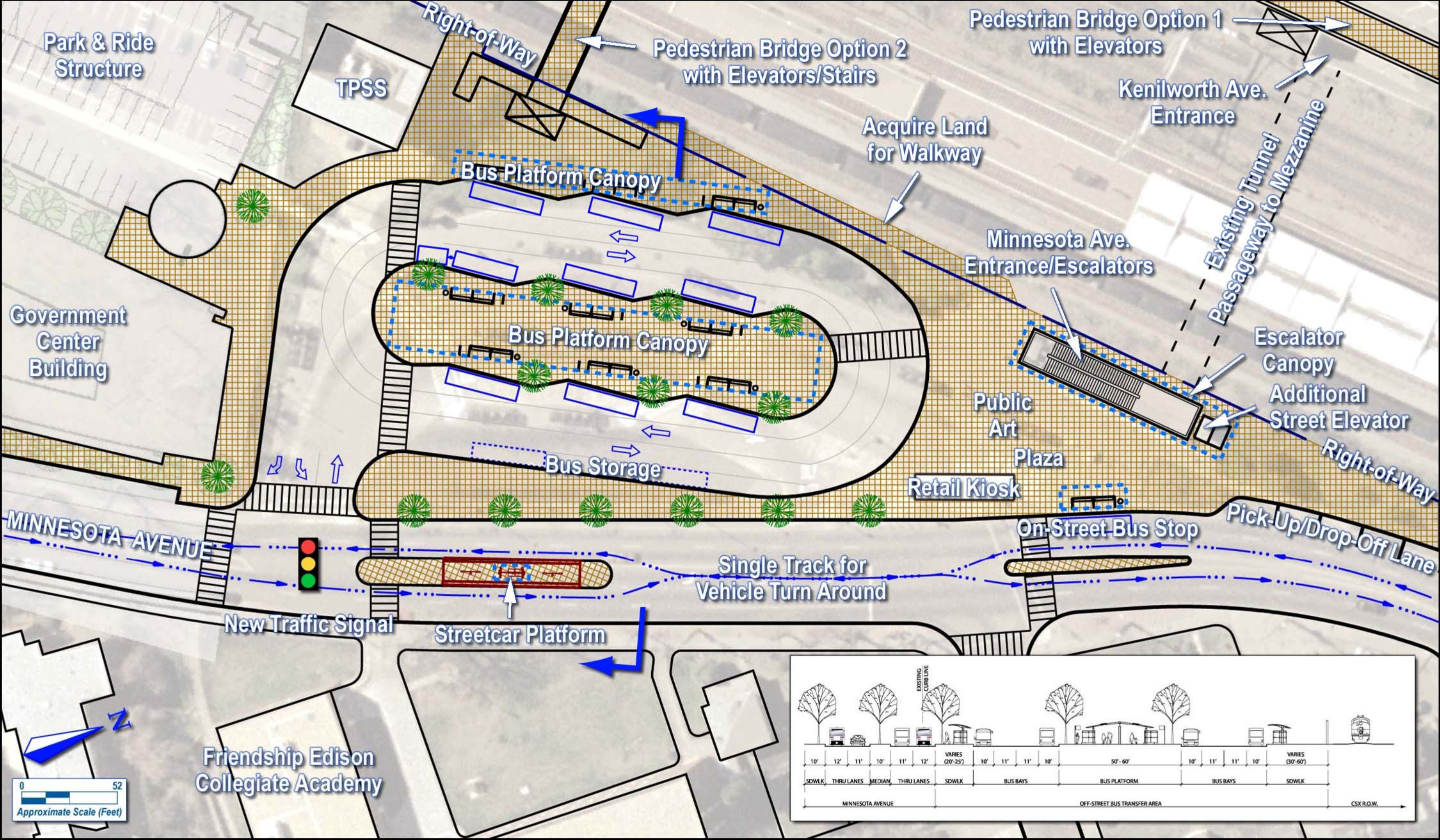


FIGURE 20: BUS TRANSFER FACILITY ALTERNATIVE 2

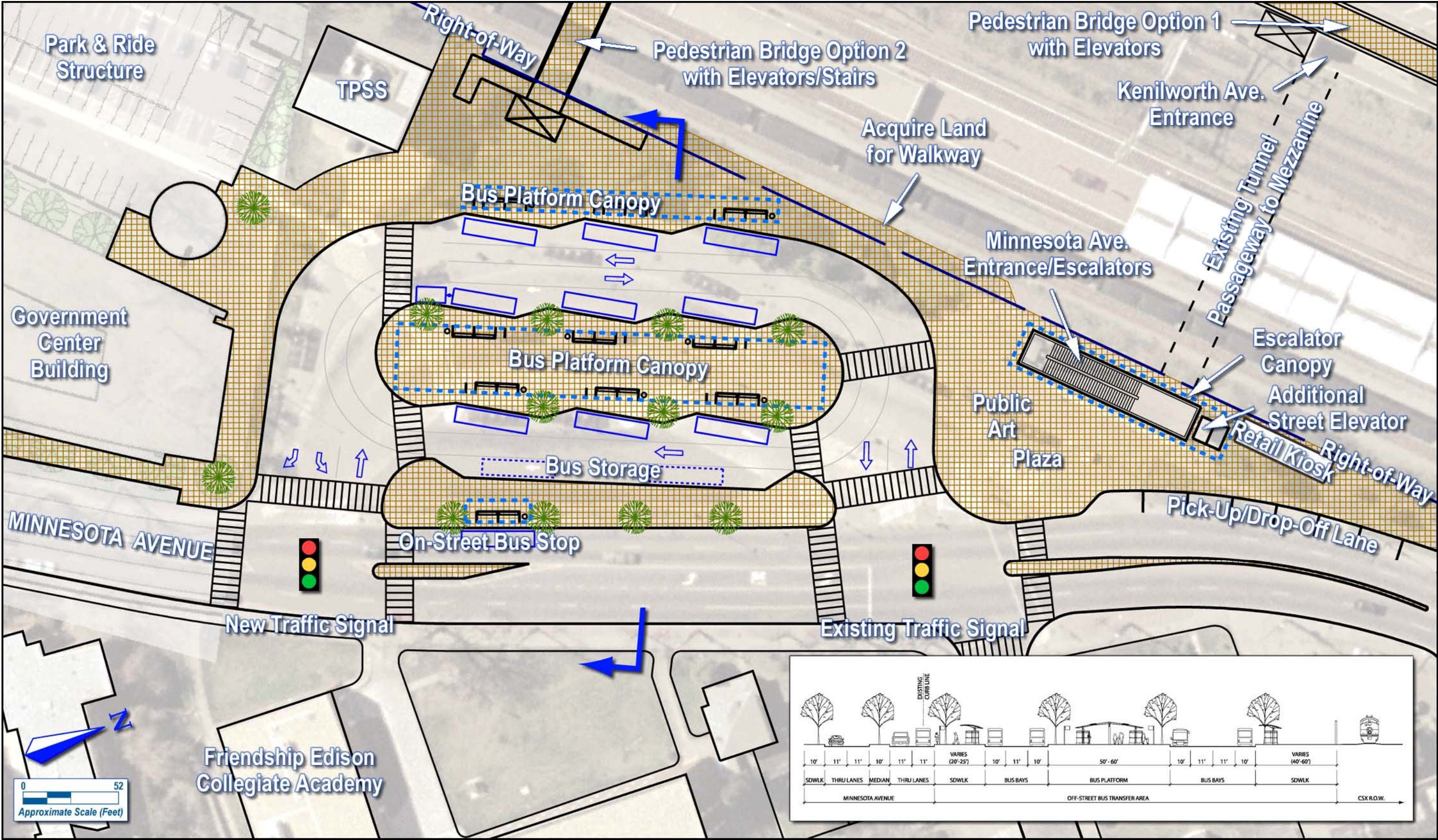


FIGURE 21: BUS TRANSFER FACILITY ALTERNATIVE 2 (WITH TRANSIT VEHICLES IN CURBSIDE LANES ON MINNESOTA AVENUE)

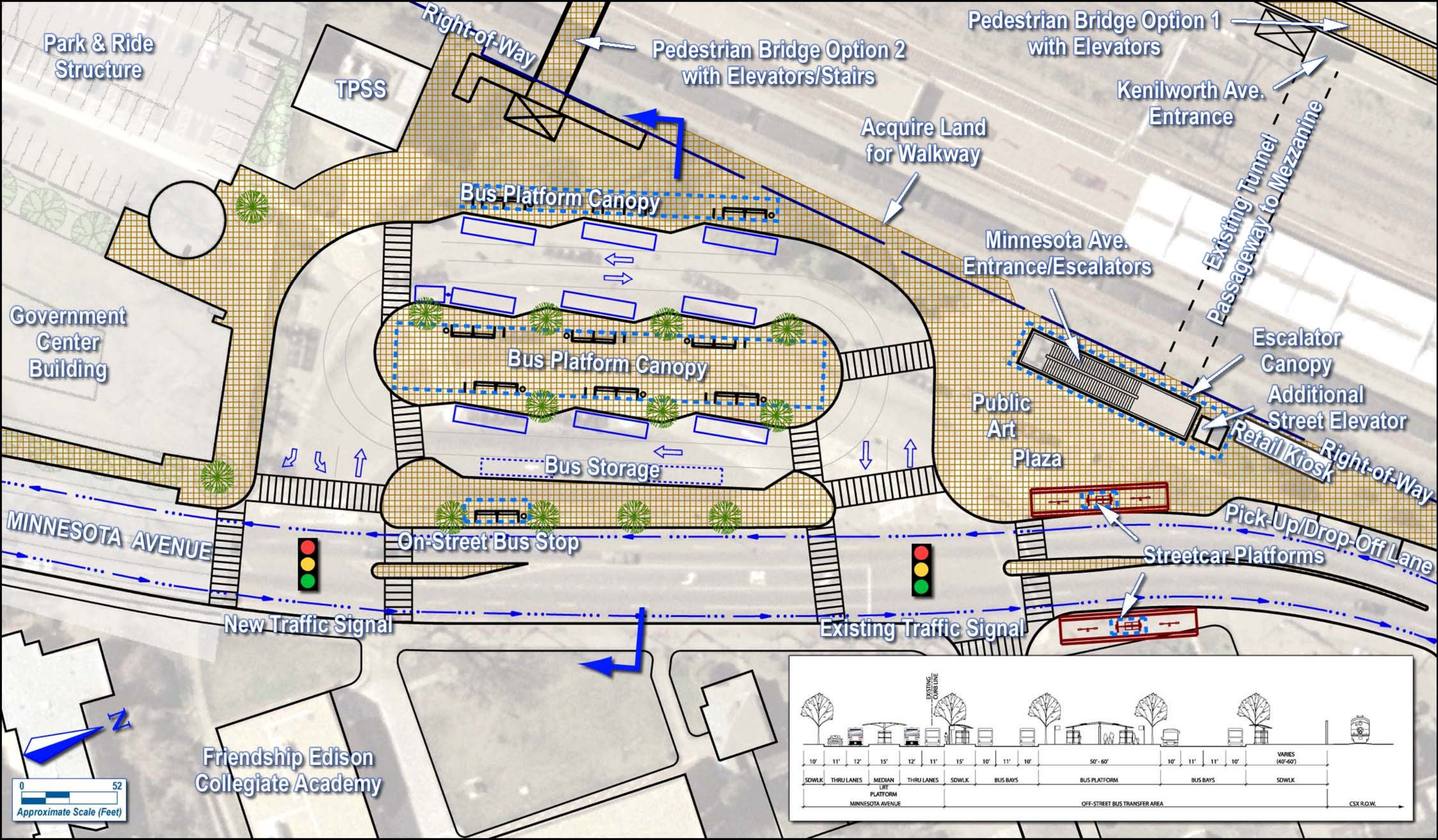


FIGURE 22: BUS TRANSFER FACILITY ALTERNATIVE 2 (WITH TRANSIT VEHICLES IN CENTER LANES ON MINNESOTA AVENUE)

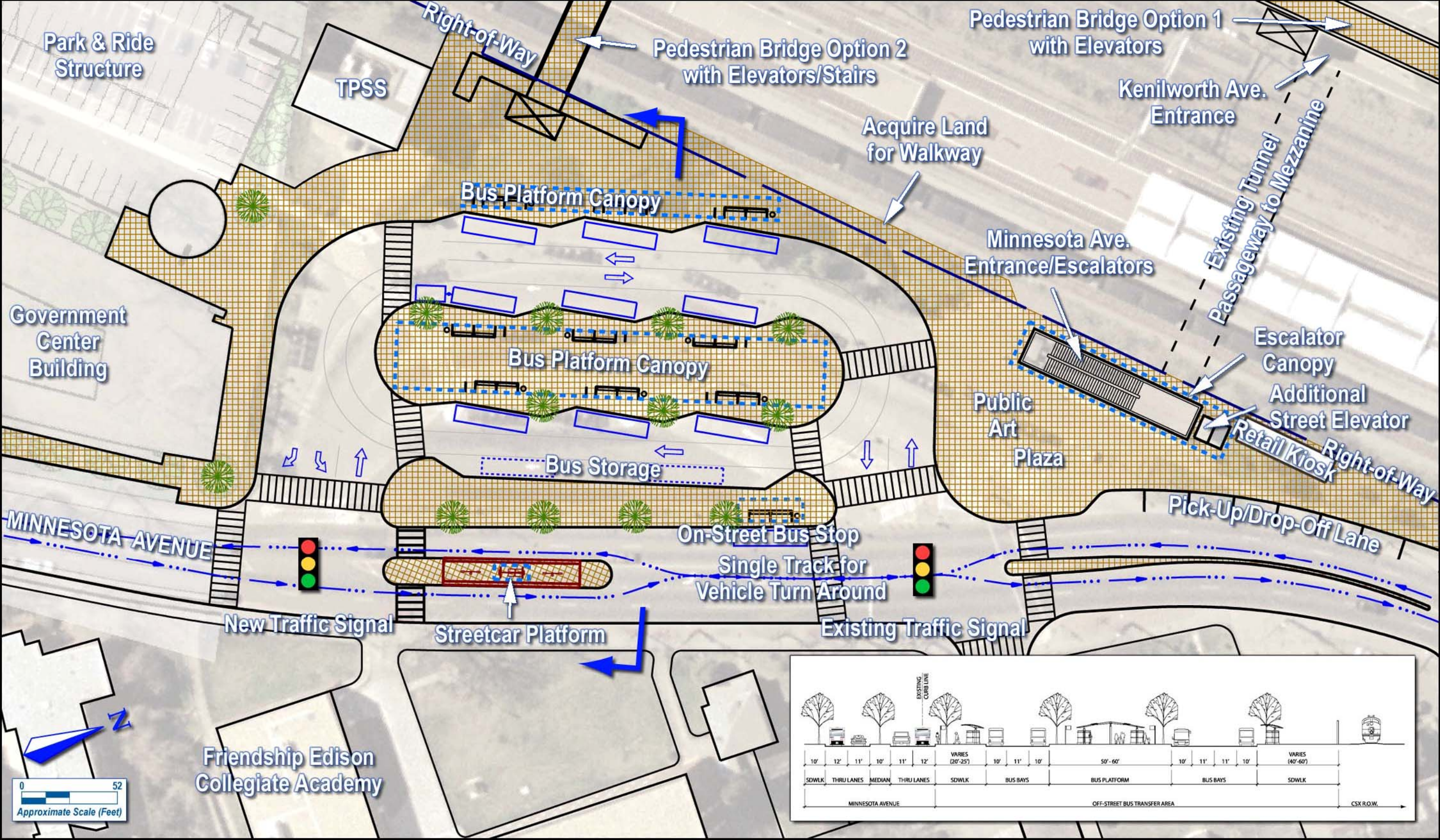


FIGURE 23: KISS & RIDE WITH VEHICLE STORAGE (WITH TRANSIT VEHICLES IN CURB SIDE LANES ON MINNESOTA AVENUE)

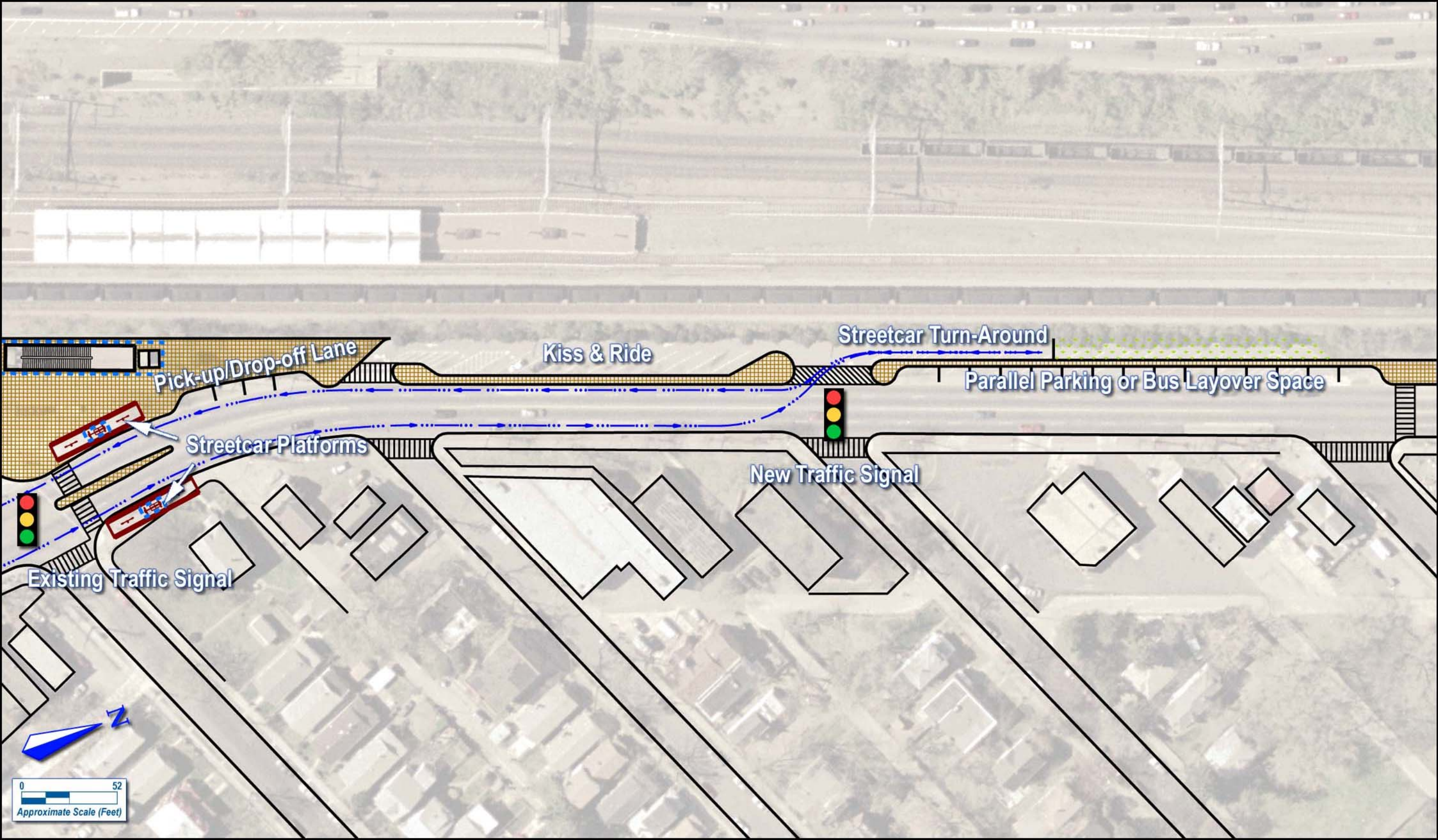
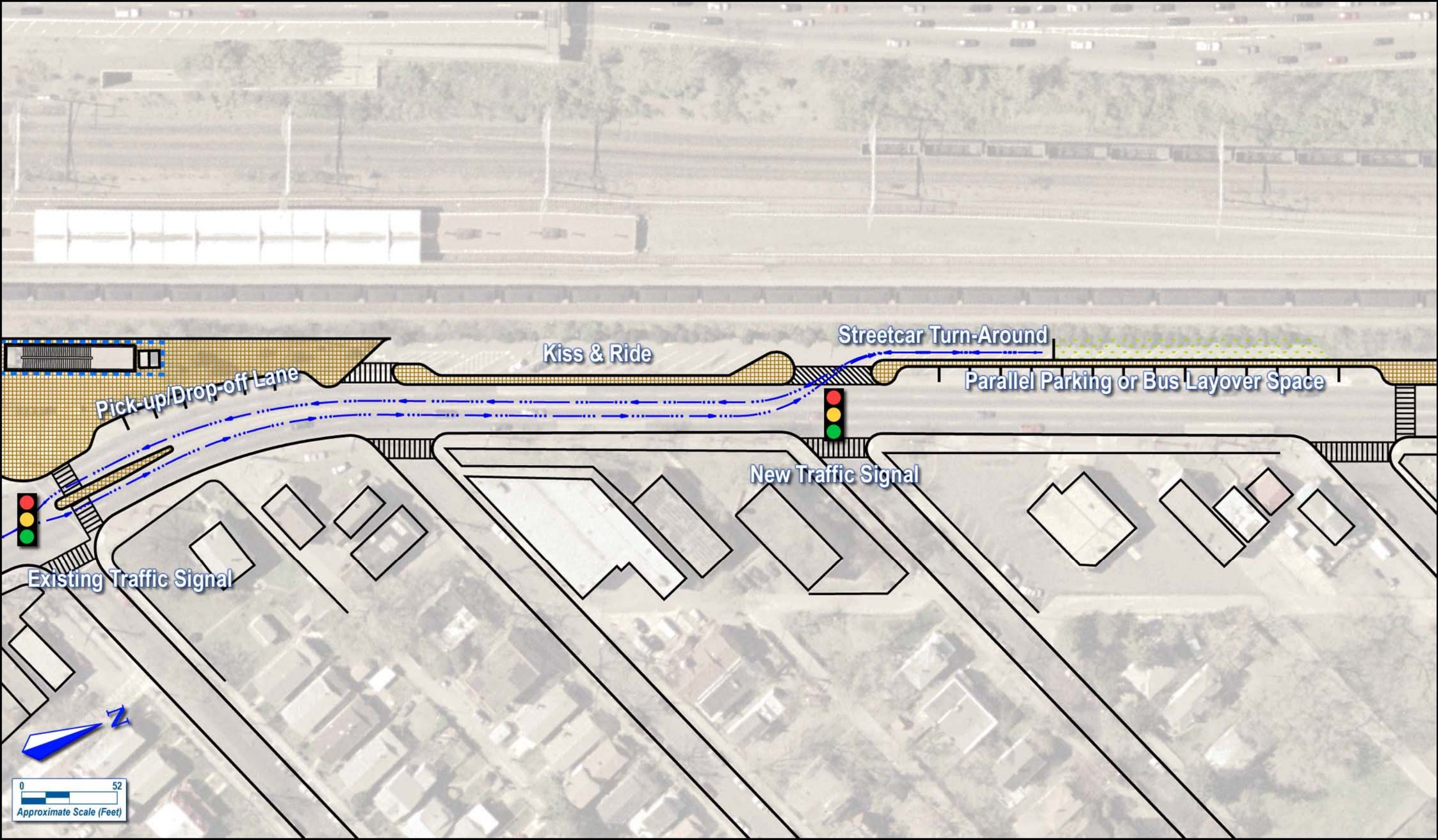


FIGURE 24: KISS & RIDE WITH VEHICLE STORAGE (WITH TRANSIT VEHICLES IN CENTER LANES ON MINNESOTA AVENUE)



MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

(CONTINUED FROM PAGE 12)

- Provide the new WMATA signature glass canopy over the escalator entrance to improve safety (both street elevators were recently rehabilitated and service reliability has increased) and provide weather protection to the station customers and the escalator system.
- Provide kiosk(s) at the public plaza for convenience retail through the proposed WMATA Retail Pilot Program.

Art in Transit Program

Improvements to the station would open opportunities to support art in the public plaza. WMATA’s Art in Transit Program is available to plan, develop, and manage an art program for the Minnesota Station Access Improvement Project.

Alternatives Analysis

The pros and cons for each pedestrian bridge option are presented in Table 4 and 5. The Parkside option provides direct access and a link between the proposed development and the Minnesota Avenue Station entrance, the Government Center, and the local community. The curved pedestrian bridge option improves security at the Kenilworth Ave. entrance by adding glazed elevators adjacent to the passageway portal, and reinforcing visual sight lines. The curved option avoids crossing above the CSX and Metrorail tracks.

TABLE 4: PARKSIDE PEDESTRIAN BRIDGE – PROS AND CONS

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none">• Provides direct connection between both sides of Metrorail station with improved connectivity to the Government Center site and bus bays.• Provides excellent visibility and enhances safety.• Creates a sense of arrival on both sides of bridge and enhances scenic vistas.• Provides good connection from east station side to the proposed Anacostia River Walk.• Elevators would improve ADA-accessibility.• Eliminates non-Metrorail pedestrian thru-traffic from station escalators and tunnel. | <ul style="list-style-type: none">• Travel distance from the west side of Kenilworth Avenue to the station mezzanine is longer for some walking trips.• New bridge landing on the east end is located in an area with limited space, adjacent to the bus facility.• Requires permission and coordination with the CSX Corporation for air-rights above tracks. |

TABLE 5: CURVED PEDESTRIAN BRIDGE OPTION – PROS AND CONS

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none">• Eliminates blind corners through curved design.• Realignment of pedestrian bridge would locate a portion of the structure adjacent to the tunnel, which would improve visibility within the west station entrance portal.• Elevators would improve ADA-accessibility.• Does not require permission and coordination with the CSX Corporation for air-rights above tracks | <ul style="list-style-type: none">• Requires use of existing passageway tunnel, which poses safety concerns, particularly during non-operating hours.• Access to bus bays or Government Centers from west side of Kenilworth Avenue is less direct. |

The pros and cons for the two alternatives for the bus transfer facility are presented in Tables 6 and 7. The single entrance option consolidates vehicle access to one point, which reduces curb cuts and allows for the construction of a full-length median on Minnesota Avenue, which would significantly improve pedestrian safety and access. This alternative would require additional right-of-way along Minnesota Avenue to allow a new a left-turn lane into the facility, which could affect planning for the Government Center development.

TABLE 6: BUS FACILITY ALTERNATIVE 1 – PROS AND CONS

| Pros | Cons |
|--|--|
| <ul style="list-style-type: none">• Creates large pedestrian space near entrance.• Provides wider sidewalk area along station side of Minnesota Avenue than currently exists.• Reduces curb cuts along Minnesota Ave.• Eliminates pedestrian crossing of bus lanes between the station entrance and Minn Ave.• Provides a median refuge island with marked crosswalks at three locations across Minnesota Ave.• Elimination of bus entrance at Grant Street, allows for an extended median that creates a boulevard type design.• Full 2-way bus loop provides off-street circulation.• Potential for bus storage area to be partially converted to an additional bus stop if needed.• Less turning conflicts on Minn Ave. (without 4-way intersections). Removes one leg from the Grant Street intersection; which should improve traffic operations at the signal. | <ul style="list-style-type: none">• Requires a second traffic signal at bus entrance/exit.• Average bus trips to the station would be a few seconds longer than the two-entrance alternative because there is only one entrance.• Needs northbound left-turn lane for buses at new traffic signal and potential expansion of existing right-of-way, which may affect Government Centers planning and the street alignment.• Consolidated bus entrance/exit and full two-way loop results in more potential bus operations conflicts within the bus facility, particularly near the entrance/exit point.• Requires approval from WMATA Bus Transportation (BTRA) to store buses that are facing in opposite directions in one lane.• Design is a “tight-fit” on the site, resulting in bus travel lanes that are less than WMATA Guidelines suggest. |

MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

The second alternative provides two vehicular entrances for buses along Minnesota Avenue, which allows for better bus access/egress to the facility with less conflicts between bus movements, and provides redundancy for bus service operations. This alternative would also provide significant access improvements for pedestrians with less curb cuts along the station area of Minnesota Avenue.

TABLE 7: BUS FACILITY ALTERNATIVE 2 – PROS AND CONS

| Pros | Cons |
|---|---|
| <ul style="list-style-type: none">• Creates large pedestrian area in front of station entrance, which may be used as a public space.• Provides wider sidewalk area along station side of Minnesota Avenue than currently exists.• Reduces curb cuts along station side of Minnesota Avenue to two access points for buses.• Improves pedestrian access to the Friendship Edison Collegiate Academy.• Provides a partial median refuge island (less than single-entrance alternative) with marked crosswalks at four locations across Minnesota Avenue.• Creates more of a boulevard type design consistent with the District’s Great Streets program.• Additional entrance/exit to bus bays provides more flexibility for bus routing.• Bus loop allows most buses to re-circulate off-street.• Could have signal pre-emption for buses.• Second traffic signal would improve access across Minnesota for Pedestrians. | <ul style="list-style-type: none">• Requires a second traffic signal, which would only be activated for buses and pedestrians.• More pedestrian crossings at bus lanes and fewer direct pedestrian links than in single-entrance alternative.• Some bus bays are accessible only from one of the two entrance points.• Buses in storage space have access to only the center island bus bays only.• Design is a “tight-fit” on the site, resulting in bus travel lanes that are less than WMATA Guidelines suggest. |

Both curbside and center-lane transit improvements on Minnesota Avenue would also work with the alternatives developed for the bus transfer facility and Kiss & Ride. The pros and cons each scenario are listed in Tables 8 and 9.

TABLE 8: CURBSIDE STREETCAR – PROS AND CONS

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none">• Streetcar vehicle services the platform when stopped outside the traffic stream, reducing traffic impacts.• Streetcar-to-Metrorail transfers do not require any roadway crossings for outbound boardings.• Streetcar-to-bus transfers require minimum roadway crossings.• Allows Buses to uses northbound left turn lane into bus transfer facility (Alternative 2). | <ul style="list-style-type: none">• Northbound transition at Grant Street impacts traffic more than center lane option.• Streetcar platform and track reduce available sidewalk space.• Transit operations may reduce opportunities for on-street bus bays or curbside drop-off/pick-up lanes. |

TABLE 9: CENTER LANE STREETCAR – PROS AND CONS

| Pros | Cons |
|---|--|
| <ul style="list-style-type: none">• More flexibility for transit operations because trains can service both sides of the platform.• More intuitive transition from Northbound Minnesota Ave to exclusive space (from left lane or left-turn lane). | <ul style="list-style-type: none">• Median platform is less desirable as a passenger waiting area.• Platforms on the near-side of traffic signals complicate signal pre-emption and increase traffic impacts.• Passengers must cross vehicle lanes to transfer to Metrorail or bus.• Vehicle Turn Around eliminates northbound bus turning lane into bus transfer area (Alternative 2). |

STATION CAPACITY AND ENHANCEMENTS

Existing Conditions

The Minnesota Avenue station has two entrances at each end of a passageway leading to the underground mezzanine. The Minnesota Avenue entrance has 2 escalators and 1 elevator from the mezzanine level to the street level. The Kennilworth Avenue exit has a single ramp to the pedestrian bridge. There are 2 escalators from the mezzanine to the station platform. The elevator to the station platform has it’s own entrance on the opposite side of the passageway from the mezzanine. The main mezzanine has five faregates. There is only 1 faregate to the separate platform elevator vestibule and lacks any fare vending equipment.

Mezzanine Capacity and Revenue Control

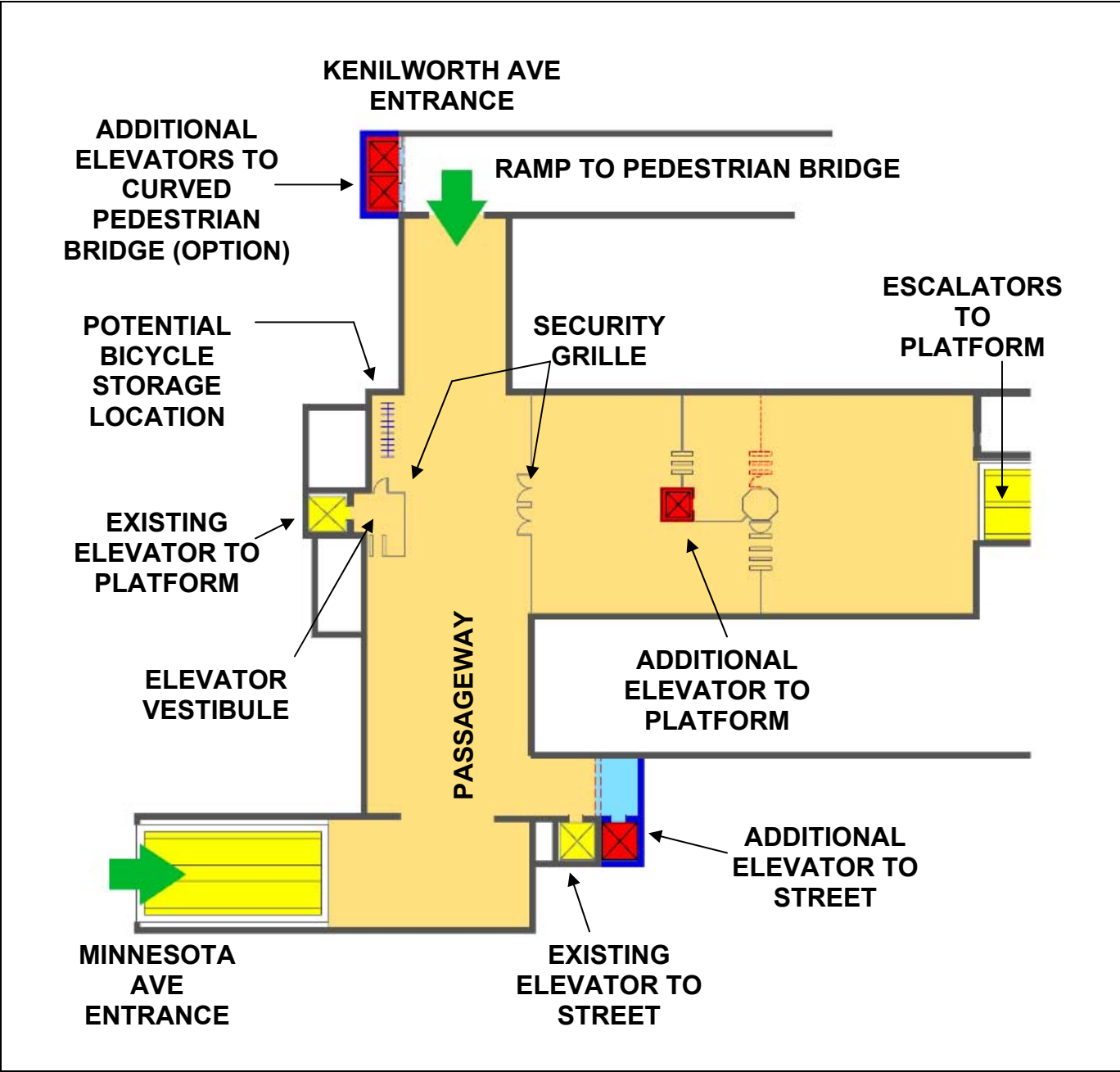
The size of the station mezzanine and the number of faregates at the kiosk should be adequate to handle the projected increase in ridership for the foreseeable future. Each faregate has capacity for 30 entries per minute, or 900 entries per 30 minutes. The faregate at the platform elevator vestibule constrains travel flow when customers must share a single faregate while traveling in both directions. Without fare vending equipment at the elevator entrance, the customer must travel to the fare vending equipment in the mezzanine first before accessing the platform elevator. Customers exiting the elevator vestibule who need to add fare to their farecards must call for the station manager for assistance. On a recent site visit, the station manager reported that fare evasion at the elevator entrance was a chronic problem due to the remote location and the inability for the station manager to control access.

Vertical Circulation Capacity and Expansion

Both sets of escalators should have adequate vertical circulation capacity to meet future ridership demand, given that each escalator can handle 3,000 people in a 30-minute period. However, elevator service is inadequate and should be expanded, which is the case at other Metrorail stations. Customers using wheelchairs that rely on elevator service cannot access the station when either the single street elevator or the platform elevator is out of service. When either elevator is out of service at a Metrorail station for extended rehabilitation, customers using wheelchairs must use the elevators at the nearest station, and then transfer to their destination station using expensive Metrobus shuttle service. For short-term elevator service disruptions, a bus must be dispatched on demand. During any elevator outages, customers using strollers, wheeled luggage, and seniors with balance problems are forced to use the escalators. WMATA policy prohibits strollers and wheeled luggage on escalators for safety reasons.

Current WMATA design criteria for the planning of new or expanded Metrorail station facilities require redundant elevator service between all levels of a station. When a minimum of two elevators is provided between each level in a station, access for station customers using a wheelchair can be provided even if one of the elevators is shut down for repairs or maintenance. Maintenance on one elevator could then be performed during revenue hours whenever necessary without restricting wheelchair access. Figure 25 illustrates how additional elevators can be incorporated at both station entrances and the mezzanine. Locating an additional elevator to the platform in the main mezzanine area and reconfiguring the faregates and pedestrian barriers would allow the station manager to better monitor the faregate use. The existing elevator entrance could then be closed whenever the station management is unable to control faregate transactions at this location.

FIGURE 25: DIAGRAM OF MEZZANINE (WITH ADDITIONAL ELEVATIONS)



NEXT STEPS

The Minnesota Avenue Station Access Improvement Study has been prepared to provide the District of Columbia with documentation for the feasibility of the proposed alternatives for station site and access improvements. If the District decides to move forward with the planning process for implementing any of

MINNESOTA AVENUE STATION ACCESS IMPROVEMENT STUDY

the improvements presented in this study, then WMATA will begin working with the District in the conceptual engineering and environmental assessment process.

The conceptual engineering process would be subject to further review by WMATA, the District, and the citizens of the Minnesota Avenue Station area community through the process of public hearing and environmental assessment. WMATA would also coordinate the design for any site improvements with other District transportation and development projects adjacent to the station.

TABLE 10: ORDER OF MAGNITUDE COST ESTIMATES

| Item No. | Element | Construction Cost | Contingency (30%) | WMATA Soft Costs | Sub-Total |
|---|------------------------------------|-------------------|-------------------|------------------|---------------|
| | | | | | |
| 1 | Bus Facilities - Alternate 1 | \$ 3,490,260 | \$ 1,047,078 | \$ 1,588,068 | \$ 6,125,406 |
| 2 | Bus Facilities - Alternate 2 | \$ 3,481,995 | \$ 1,044,599 | \$ 1,584,308 | \$ 6,110,901 |
| 3 | Kiss&Ride Facilities - Alternate 1 | \$ 974,120 | \$ 292,236 | \$ 443,225 | \$ 1,709,581 |
| 4 | Kiss&Ride Facilities - Alternate 2 | \$ 974,120 | \$ 292,236 | \$ 443,225 | \$ 1,709,581 |
| 5 | Parkside Pedestrian Bridge | \$ 3,603,875 | \$ 1,081,163 | \$ 1,639,763 | \$ 6,324,801 |
| 6 | Curved Alignment Bridge | \$ 3,661,765 | \$ 1,098,530 | \$ 1,666,103 | \$ 6,426,398 |
| 7 | Street Elevator | \$ 1,370,045 | \$ 411,014 | \$ 623,370 | \$ 2,404,429 |
| 8 | Platform Elevator | \$ 1,004,450 | \$ 301,335 | \$ 457,025 | \$ 1,762,810 |
| | | | | | |
| Total (Alternate 1): Items 1, 3, 5, 7, and 8 | | \$ 10,442,750 | \$ 3,132,825 | \$ 4,751,451 | \$ 18,327,026 |
| Total (Alternate 2): Items 2, 4, 6, 7, and 8 | | \$ 5,430,235 | \$ 1,629,071 | \$ 2,470,757 | \$ 9,530,062 |
| Total (Alternate 1/No Bridge): Items 1, 3, 7, and 8 | | \$ 6,838,875 | \$ 2,051,663 | \$ 3,111,688 | \$ 12,002,226 |
| Total (Alternate 2/No Bridge): Items 2, 4, 7, and 8 | | \$ 6,830,610 | \$ 2,049,183 | \$ 3,107,928 | \$ 11,987,721 |

[1,2] Bus Facility costs include Site Demolition, Paving, Curbs, Shelters, Canopies, Trees, Lighting, Traffic Signal(s), Utility Relocation
[3,4] Kiss & Ride Facility costs include Site Demolition, Paving, Curbs, Canopies, Trees, Lighting , Traffic Signal, Utility Relocation
[5,6] Pedestrian Bridge costs include Piers, Steel Structure, Canopy, Enclosures, Finishes, Lighting, Stairs or Ramp, and Elevators
[7,8] Elevator costs include Demolition, Excavation, Structure, and Finishes
*WMATA Soft Costs (35%): Design+Engineering (10%), Design Management (10%), Construction Support (10%), and Insurance/Bond (5%).
*Costs do not include Retail Kiosks, Escalator Canopy, Streetcar Systems, or Land Acquisition.
*The Order of Magnitude cost baseline date is January 2006 and does not include escalation costs.